



21-12-22

A-96-24857

S.M.
B.A.

10613

JOURNAL & PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL.

New Series, Vol. XIII.

1917.



891.05

JASB

CALCUTTA:

PRINTED AT THE BAPTIST MISSION PRESS, AND PUBLISHED BY
THE ASIATIC SOCIETY, 1, PARK STREET, CALCUTTA.

1917.

A372



DATES OF PUBLICATION.

Journal No. 1	pp. 1-104	Proceedings pp. <i>Nil</i>	May, 1917.
„ No. 2	„ <i>Nil</i>	„ „ i-ccix	July, „
„ No. 3	„ 105-75	„ „ <i>Nil</i>	„ „
„ No. 4	„ 177-252	„ „ <i>Nil</i>	Nov., „
„ No. 5	„ 253-306	„ „ cexi-ccxxviii	Dec., „

(Volume complete in 5 issues.)

DIRECTIONS FOR BINDING.

The pages of the Journal should be bound first after the list of papers; they are numbered in Arabic numerals. The pages of the Proceedings should follow them; they are paged consecutively in Roman numerals. The Index is paged in continuation of the Proceedings.

Plates	i-vi	to follow	page	151
„	vii-viii	„	„	176
„	ix	„	„	253
„	x	„	„	306



CONTENTS

PAPERS

	<i>Page</i>
'ABDU'L WALI	
'Alam Khān's Mosque at Katwa	127
Madāran and Mubārak-Manzil, in the District of Hugli ..	131
The Tōpkhana Mosque at Śāntipur	139
The Antiquities of Burdwan	177
CHATTERJI, S. C.	
Detection of Lactic and Glycolic Acids and a suggestion regarding the Constitution of Morphine	281
DAS-GUPTA, HEM CHANDRA	
On the occurrence of Limburgite in British Baluchistan ..	293
FYSON, P. F.	
Note on a Malformation of the common pine-apple (<i>Ananas Bativus</i> , Schultb.)	253
Notes on the Ecology of the Nilgiri and Pulney Highland Plateaus	255
GIBSON, C. S. AND SIMONSEN, J. L.	
Stereo-chemistry of Alanine Derivatives	191
GUPTA, B. A.	
Folklore in Caste Proverbs (Bombay Presidency) ..	1
HODIVĀLĀ, S. H.	
The Dirham-i-Shar'ai	45
The Weights of Aurangzeb's Dāms	62
Some heavy rupees of Bahādur Shāh Shāh 'Alam I ..	67
The Mint name Srinagar	69
Bahādurgarh	73
'A'Azāmgarh	76
Panjnagar	78
The Murādi Tankā	80
Firūzgarh	98
JACOB, K. CHERIAN	
Observations on Pollination in <i>Alysicarpus</i>	287
MEERWARTH, A. M.	
The Dramas of Bhāsa : a literary study	261
MITRA, SARAT CH.	
On some Indian Ceremonies for disease transference ..	13
On secrecy and silence in North-Indian agricultural ceremonies	27
Riddles current in the District of Sylhet, in Eastern Bengal	105

	<i>Page</i>
PARUCK, FURDOONJEE D. J.	
The Drachme of the Sassanian queen Borān	43
A new type of Silver Dirham of the Sassanian monarch Zāmāsp (Jāmāsp)	51
The Zoroastrian deity 'Ardešīr' or 'Ardvishur' on Indo- Scythian Coins	56
On a gold coin of the Sassanian king Shāpur the Great ..	59
A Silver Dirham of Bastham	100
Three Interesting Sassanian Drachmes	156
On a silver coin of the Sassanian king Khorezād-Khusrau ..	162
PHELPS, W. H.	
Notes on the habits of <i>Cyrtophora citricola</i>	23
RAO, Y. RAMCHANDRA	
Notes on some South Indian Cecidomyiids causing galls in grasses	299
SARKAR, G. D.	
Some traditions about Sultan Alauddin Husain Shah and Notes on some Arabic inscriptions from Murshidabad ..	143
SASTRI, HIRĀNANDA	
Novelties in Gupta coins	153
SIMONSEN, J. L.	
See GIBSON, C. S.	
SUHRAWARDY, A.	
Notes on important Arabic and Persian manuscripts found in various Libraries in India	lxxxix
TESSITORI, L. P.	
A Progress Report on the work done during the year 1916 in connection with the Bardic and Historical Survey of Rājputānā	195

A

JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL.

New Series.

Vol. XIII.—1917.

1. Folklore in Caste Proverbs (Bombay Presidency)

By B. A. GUPTA.

Caste proverbs in the Bombay Presidency have been so arranged here as to show the territorial peculiarities of the long strip of land extending along the West Coast from Karachi to Goa, containing Sind, Gujerat, Kathiawar, Maharashtra and Kanara. Each has its own language with several dialects, one merging itself into another of an adjoining tract and forming a chain co-existing with the several tribes and castes naturalized. It would not be convenient to sort them strictly according to the linguistic areas of the Presidency. There are proverbs with one half in one language and the other in another. They have therefore been grouped under caste-names. For instance among proverbs applicable to Brahmans, readers will find those used in Sind, Kathiawar, Maharashtra and Kanara, showing side by side their local peculiarities and shades of evolution. For instance, the Brahman is respected more in the Kanarase District than in the Maratha country, he is less honoured in Gujerat and loses his influence in Sind. The Baniya on the contrary receives more encomiums in the North than in the South. The Rajput is not met with in Kanara. In Gujerat and Kathiawar he is much in evidence but is evidently not liked. In the Maratha country he receives nothing but praise. Compared with the emigration of the Indian castes these likes and dislikes are valuable data. Proverbs record accumulated wisdom of ages. For example, Sind says "Love makes n

17

inction between good caste and bad one," that is equivalent to "love levels rank." The unrestricted social transition among Mahomedans in Sind is visible in the adage "His father pounded rice, and his grandmother pounded coriander seed, for their living." "Hereditary caste predominated only in former days, but now wealth regulates social status." Turning to Gujerat we find "A Pārsi in a Hindu's house! Impossible!" The religious difference between the Hindus and Mahomedans shows tendency to reconciliation in the proverb, "Hindus worship Rām, and Musalmāns worship Rahim, but both quarrel with one another, because they do not understand that Rām and Rahim are but one."

The modern Parsi is proud of the absence of idols in his faith but conveniently forgets that the worship of the elements like fire and water is more primitive and directly animistic. He boasts in Gujerat, his adopted motherland, that his religion is "like the water of the Ganges"! If Mark Twain's description of the Ganges near Benares proves the purity of its water, the comparison is right enough in spite of insanitary facts! The influence of environments tells itself in the Hindu head-dress of the last generation, and in the proverb that to the "*Holi* of the Hindus the Parsi woman offers a cocoanut." The Gujeratis record, that "every uncle says that his caste is the best, and that scholars adorn caste." In Kanara, "a caste hates caste." "If a man goes wrong his whole caste is disgraced," "Self-gratification means loss of caste, self-denial is a gain to caste," "A good speech is the sign of good caste," "Virtue is the same everywhere in spite of caste, and magnitude of crime bears no relation to the caste of the criminal. Sind records that the farmer or Aher is poor, his wealth consists of an earthen *chatty*." To those who wish to study the peculiarities of castes representing hereditary professions, it would be a fascinating study to push on comparison between rival groups, but for easy reference an alphabetical arrangement is the best. I have adopted it here. (1) The Agasa caste lives in Kanara. (2) Agasa or washerman uses other people's clothes. (3) The Agasāle or goldsmith of Kanara is as much a thief as the corresponding members of his guild all over India. (4) The Ambigan's son helps his father in oaring his loaded boat, but his wife stinks of fish and the blows of an oilman's wife are preferred to her kisses. (5) The Bādagi or carpenter of Kanara is a drudge: he has to do what his master tells him to do. (6) The Badhāi or enter of Sind is forgotten as soon as his work is finished. The Baleyarna or bracelet-maker of Kanara wants a bas to pick up the shattered pieces of his load (glass es) if it unfortunately falls from his head. (8) The a is known everywhere by his anglicized name, he affords ter opportunity for comparison between his tract and

must be a fool. The Audich Brahmans claim to be cleverer than the Modh Sect. A Brahman will beg even if he be so rich as to possess silver begging bowls. A poor farmer works in the field, gets a crop with the sweat of his brow, and the Brahman drone *claims* alms, and at the end of each religious ceremony his wife gets sweets. Life is said to be very dear to the Brahman, he merely wants dinners and *dakshina* or alms in cash in addition. A Brahman will come to the door any day and claim at least a handful of rice. A Brahman cannot be relied on as a protector. Brahman calls the cow his mother, and covetously looks at her because he wishes the owner to give him the animal in charity. The gods get merely the words or *mantras* recited when food is offered to them but the food so consecrated finds its place in the belly of the Brahman. A Brahman will always beg and make others beg. Brahmans have no sense, they will lose everything for dinners. In strength, the combined effort of twelve of them is equal to the strength of a goat. If a dinner is offered to a Brahman he will ask you to send it to his house with something more: he is so covetous. Brahmans are made to eat and to move their hands over their distended bellies, but to eat at a Brahman's is just like taking a poison. He will never give others any good food. If uncooked food is offered to a Brahman, he will insist on having a cooked dinner for himself, and take the raw stuff home. He will not go until he gets something out of you. He feels no shame. He is quarrelsome to boot. A Brahman wants you to do what he tells you to do and not what he himself does. He acts like a monkey when he sees cooking materials and food. It is said that a polluted Brahman is better than a Mahomedan! When a man swears by some one, it is believed that that person dies at false swearing; on such occasions you are advised to swear by a Brahman—as he can be easily spared. Southwards in the Marātha country which was recently directly under the sway of the Brahman ministers, the Peshvas, the position of the Brahman has slightly improved, and yet his gormandism is notable. If a Brahman gets rice to eat to satiation, he wants cakes as a present. He gets plump during *Bhādrapad*, the month of the *shrādhās*. The gods, it is said, have become false and the Brahmans have become polluted. If one man wants to curse another he says, "May God thrust a Brahman manager in your affairs"—so ungrateful and treacherous he is; but the prestige of the Brahman is retained by the proverb—"A Brahman, ever so depraved, is still at the top in the three worlds." The Brahman has liking for butter, curry, and butter-milk or whey as well—that is, he leaves nothing. A priestly Brahman will always be ready for a dinner partly by carrying his sacred dinner-garment always under his arms. Servants of Brahmans get only stale bread. Priests or laymen—they are hereditary—one is not more sacred than the

A 372

N. S. Vol. 13 for the year 19.

other. Give the priest a small corner in a verandah and he will, by degrees, take the whole house, *i.e.* turn you out. If you ask him to get himself married, he has the impudence to say that his village fees include everything (whatever that may decently mean). If a woman makes that request he will shamelessly ask her to marry him. If money is paid to a Brahman for favours (official or otherwise) it is only a gift or alms, but if paid to a clerk of another caste—it is a bribe! Brahmans die of excessive eating. Priests care only for their gains, may the bride or the bridegroom die. In one proverb a non-Brahman says, “Oh God, do not give me the birth of a Brahman-priest who is never satisfied and is ever begging.” The Desbath or Dekkan Brahman, as distinguished from the Konkanasth, is less polished, untidy, and simple. Further south in Kanara where Dravidian blood predominates even in the higher grades of the society, we are told not to trust a black Brahman or a fair Holeya. A warrior’s valour is no match for a Brahman’s cunning. Only one Brahman was ruined by trusting in many gods, but many men were ruined by trusting a Brahman. Brahmans in a town are crabs in a tank. Whatever a Brahman does, is for the mānes of your ancestors. Brahman’s hatred is unbearable. Anger not a hungry Brahman for fear of his curse. Do not abduct a woman from a Brahman’s house. (24) The Chamār or shoe-maker in Gujerat and Kāthiāwār is ranked with the Dhed. As he lines drums, it is said that music is always played in his house. Although he makes shoes, his wife is so poor that she gets none to wear. He must not express opinions except in regard to his trade. In the Marātha country, he never keeps his word as regards the completion of the shoes entrusted to him. He always looks at the feet, he can only be influenced by beating with shoes; there is always a stench in his house: he is absent-minded, evasive and inquisitive. (25) The Chhipās or calico-printers of Gujerat and Kathiawar have no knowledge of accounts. (26) The native Christians (among whom are included the Goanese domestic servants of Europeans) are becoming impudent. (27) The Chunarās or mortar-men of Gujerat are quarrelsome though constitutionally weak. (28) The Dabgirs or drum-makers of Sind cannot expect to be rich. (29) In Gujerat, the Darji or Tailor will steal at least a small piece of the cloth entrusted to him, and he demands money for sewing foresooth! (30) In Kathiawar and Gujerat the Marathas are called Dekkanis. You are advised to avoid friendship with them. (31) The low singing minstrel Dhadhi will do nothing but sing in the marriage festival in her own house. (32) A Dhagda thinks himself rich, if he gets a couple of *pies*. (33) The Dhangar or shepherd of the Marātha country is absent-minded. (34) In Gujerat or Kathiawar the touch of a Dhed pollutes. He is poor, despised, depressed. The Gujerāthis and Kāthiāwāris complain that

under the British rule the low untouchable Dhed pushes you aside with impunity. The surroundings of a Dhed's house are filthy. You will find bones lying all over the place, as he is a carrion-eater. (35) The Dhobi's dog is useless, as he belongs neither to the house nor to the washing *ghāt*. If the Dhobi is looted, it is his customer who loses; his income is lost in paying his assistant, his greatest friend is his washing stone, he gets good clothes to wear. You are advised to have a new Dhobi from time to time. A king's valuable scarf is but a Dhobi's sanitary towel! He is a rogue. (36) Domba, Dombār, Dombāri, Dom, Dum, the strolling clown is ruined if he prefers solitude. He is also a stone-carrier, and keeps donkeys. He is despised. As he has to wander about, his wife offers a thousand thanks to God when he returns home. (37) In the Maratha country, the Dravidian or Madras Brahman is not considered straight. He will beat about the bush and never go straight to the point. (38) The Dublā of Gujerat and Kathiawar is poor: he lives from hand to mouth. He knows all the hills and dales; he will work as long as you supply him with food. His wife's morals are at the mercy of the Desāi landlord—May God take care of him! (39) A Gadhvi is a Gujerati name for a Chāran, the well-known itineracy carrier. Wherever he goes, he has his "home" with him. If he needs rest, he dozes on his animal. (40) The Girāsiās of Gujerat are poor. Everybody claims his mare for use. (41) The Ghānchi or oil-man of Gujerat has a quarrelsome wife. His bullock walks miles all the day and yet he is not a bit further from the starting point—the oil-mill. (42) Golā is a cow-herd of Gujerāt and Kathiawar. He stealthily drinks the milk of the cows. He is defective in common sense. His wife will never admit that her milk is not good. (43) The Golak is a cross breed in the Marātha country born of Brahman widows. His wearing a sacred cloth in imitation of the Brahmans means nothing. (44) A Gujar's daughter is a chest of gold to her parents, because he gets a heavy bride's price. (45) The Marāthas consider the Gujerātis, as a class, an ignorant race—and say, "Kick them and then speak to them." (46) Gurav, the temple servant and musician of the Marātha country, jealously watches the offerings placed before the idols, but his rice soon disappears, because he has in turn to feed many hungry mouths—those of the votaries of sorts. (47) The Hajām or barber in Sind is a *clumsy* workman. In Gujerat and Kathiawar the Hajām is vain. He is called Ghaijo, Waland, and Mashālchi. An old Hajām is preferred. He cuts a child's scalp without feeling. He is among men, what the crow is among birds. He cannot keep a secret. He demands cash payment. He is a whimsical, unreasonable, tell-tale rogue. (48) The Holeya of Kanara is a depressed and despised man like the Chandāl. He should not be trusted, if he is fair. The Brah-

mans have taught him the use of the *pindas* (rice balls offered to the dead), but he cannot get anything out of it, because he is an untouchable. (49) The Jhārekari is a low class Gujerāti who washes gold dust. He is an indispensable friend of the goldsmith or Soni—because the latter is a professional thief and the ashes about his crucible—the store-house of his stolen goods—require washing every day. (50) Joshi is one of the names assumed by the *luchās* or pick-pockets of the Marāṭha country. They represent a declared criminal tribe and yet it is said in a proverb that one bag is equal to hundred Joshis. (51) The Gujeratis call the resident of Kutch—Kalchhias, and designate them as a set of cunning fellows. (52) The Kadiya or mason in Gujerat always comes late. (53) The Kamār or blacksmith of Kanara is not considered a clever artisan. (54) The Kanabi, or farmer of Gujerat, is the back-bone of agriculture. His wife rejoices whenever there is a prospect of good rain; he is forgetful: he requires harsh treatment to make him work. The Brahman is the leech on a Kanabi—a drone who lives by alms. (55) The Kansāra and the Kansār of Gujerat and Bombay is the copper-smith to whom all broken vessels go back. (56) Kasāis or butchers in Gujerat are said to be prosperous nowadays. A Khātiks in the Marāṭha country is devoid of humane feeling. (57) The Kayej is a Gujerati corruption of Kāyasth. It is said that he cannot be trusted, as he is vindictive like a tailless snake. (58) Khedāval is another territorial appellation to a sub-caste or tribe of Banias like the Nāgar, Lāds, Surtis, and Kachhis, Vādnāgras, Visānāgras.

This remarkable feature of the Gujerat Society shows an evolution from territorial to tribal names, as one goes from North to South. (59) The Hill Koli of Gujerat will plunder a house if he be hungry. The boatman Koli will have no work during the *Holi* as people do not travel to make use of his ferry. He is very talkative, but has no reasoning power. (60) The Kāmāti of Kanara is a troublesome neighbour. (61) A Kumbhār or potter never gets a good pot for his own use, he is not wiser than a donkey he always thinks of his pots; if all the pots he makes remained entire there would be no room for them. He takes a lump of clay on his wheel and gives it any shape he likes. When angry, he vents his wrath on his poor donkey. He tramples on clay, but he is threatened in return to that very dust, "Dust thou art and unto dust shalt thou go"—one day. In the Marāṭha country the Kumbhār is not credited with foresight. His daughter-in-law cannot keep herself in the Zenana, as she has to collect sweepings and rubbish for fuel for the kiln. In Kanara, a potter is called Kumbār instead of Kumbhār, but he is considered a wise man. A cudgel will destroy in a minute what the Kumbār can do in a year—so fragile is his ware. (63) The Kunbi is the farmer of the Marāṭha country. He is so foolish that he has often to do his

work over again. He is obstinate, he is as crooked as his sickle. He is great at giving alms although he is poor. He wants beating, he wants plundering. He is thought unfit for higher education. He talks at random. His devotion lasts as long as he wants help, but there is no giver like him. He wants looking after, he believes in ghosts, he of the Konkan has no courage. He will pine away, if the rains are insufficient. (64) The Lālia, a cross breed of Gujerat, plays with the dancing girls of the country. He gets a band of music gratis for his marriage. (65) The Labhān is a name given to the Chāran in the Maratha country. He is a great onion-eater. (66) Langha is a class of immodest drummers and dancers in Sind. A Langha is shameless. (67) Likhan is a class of writers in Sind, whose script is so unintelligible that God alone can read it. (68) The Lingāyat and his priest the Jangam are the natives of the Kanara districts. The Jangam has no family. He wears no sacred thread. The Lingāyat-oil-man is called Banjig. He knows all about oil-seeds. (69) In the Lohār's (Smith) lot, there are embers. In Gujerat you are advised not to sit near him. His face is always black with smoke and coal-dust. The Marāthās say that "where there is Lohār there is iron." (70) The Gujerat Machhi or fisher-woman is very talkative. (71) The Madigana or cobbler of Kanara is dirty and untouchable. (72) The Mahār of the Marātha country has a right to a bread from every house, as he is the hereditary watchman, but if he gets a small quantity of grain he and his wife get stuck up. His touch defiles. He is the gate-keeper of the village. The gift of an old blanket pleases him. His children being low, play with bones. (73) Low caste residents of Mainwara in Rajputana are called Mainds in the Maratha country. A Maind prospers during famine, because his land is artificially irrigated. If offended the Māli will not give flowers. The Māli may water his plants assiduously, but he must wait for the fruit until the season comes. (75) The Mānbhāv or Shudra priests lead a celibate life. (76) The Māngs of the Marātha country are keepers of paths. They are a depressed tribe and the marriage tie is very loose among them. (77) In Gujerat and Kathiawar the Marāthas of the three-cornered turban are not trusted. (78) The money-lender of Mārwar and specially of Bikaner is called a Mārwarī in Gujerat. He is said to be increasing like wild cactus. He is selfish. Like crows Mārwarīs are seen everywhere. (79) The Mihār or herdsman is absent-minded, but an invocation is added that "May he not die and leave his herd orphaned." He is necessary. (80) The Mochi or shoe-maker of Sind gets beaten with shoes of his own make. In Gujerat and Kathiawar, he is considered a fool, his aunt wears a dress received as a gift (a skit against looseness), his wife easily leaves him and marries another; a Mochi will grieve, because he cannot get his own skin to tan. The sons of Mochis are

becoming rude. A Mochi's to-morrow will never come. He is dilatory. (81) The Musalman is much noticed in proverbs in various ways and under various denominations. In Sind he is credited with the face of a Mulla and the heart of a butcher. He is said to be very ignorant and poor. He is married to any number of wives, even when one foot in the grave. He cares only for eclat and show, and calls himself a *pir*. The *Jāt* Musalman forms a separate cognate group in Sind. He is poor, hungry and ignorant, a troublesome creditor even if he owns a few *pice*, he can not be relied on, he is ungrateful. The Memons of Sind are Mahomedan merchants, and share the encomiums levelled at the Baniyās. The Katija is a woman who lives on the wages of shame of young Moslem girls. The Kāzi can do nothing if the bride and the bridegroom agree. The Khandias represent a robber tribe just as the Shabranis are. The Srutria is a Moslem beggar who does not care what neighbour dies and enjoys his *sherbet* drinks. The Mogul is a degenerate coward. He beats the women of his house. But fresh arrivals of Moguls excel the locals in the use of the Persian language, as the latter have theirs corrupted. Mullas are great eaters. In Gujerat Sāyi or Fakir is ironically called a great prophet, his curses are very bad. The carder or Musalman Pinjara is weak. A known Pinjara will not do his work so well as a new one. The naturalized Negro is called Habsi in Sind. He is strong but lazy. Musalmans are called Tarakdies in Gujerat (from Turk) and it is said that they get mad during *tābuts*. The Mulla or priest marries for Alla's sake. He is quarrelsome. In Gujerat the appellation Mian becomes Miya for a Musalman. He is half educated, he is full of defects, his wife is pompous, he is a low-class peon. A Miya has a perverse mind. A hard-up Miya will eat carrion, and yet he is a dandy, but he is a rat at home. He does not agree with his wife. His friendship is not lasting. He is reckless. He has a dejected face. A Musalman is always after prostitutes and his wife after the cooking vessels. If he has to go to the North he will say that he is going to the South. He thinks he is a very wise man. He is engaged in profitless disputes. Do not take his advice, you will repent. If his wife dies to-day he will marry another to-morrow. He is lazy, he is a top. The Pathan among Musalmans is strong and fiery. In the Maratha country, a Musalman will eat, wash his hands, and as soon as they are aired, he is hungry again. He is unfaithful. He is dull, pugnacious and low. In Kānara, you are advised not to anger a Musalman. (82) The Nadigana is a barber in Kanara. His wound is intolerable. His razor cuts. (83) Territorially the Nadiadis or people from Nadiad are less quarrelsome than the Patlādis and Umrathis. (84) Another territorial division of Baniyas is that of the Nāgars. A Nagar will never speak the truth. He is fair. It is difficult to defeat a Nāgar. Brides are very

costly among Nāgars. He is as good-natured as a crow! He will never be yours. His speech is like a snare. (85) The Nundars are cultivators in Sind who are said to be great smokers. (86) The Otāri of the Marāṭha country is a smelter. In Poona, brass idol-casters are also called Otāris. They are Jingars by caste, and call themselves Panchāl. (87) The Pārsis first landed in Gujerat, when they fled from their mother country, and became Gujeratis. They are fair, but in the dark the Andhāru will be found groping in the dark, for what, God knows! The Dastur or chief priest will ask a Pārsi to present him with a gold or silver chain to wipe off his sins. In the Marāṭha country it is considered a wonder of the world that the Pārsis should be educated, and yet they should sell oil. A Pārsi is a man of after-thought. He takes no time to change his words. A Pārsi's liquor shop is everywhere—like a crow's nest. When insolvent, he will sell liquor. He will celebrate the day sacred to Zoroaster by drinking liquor. He has no caste. He is not fit for the company (among Hīndus). His wife has still retained traces of the early adoption of the Hindu customs, and offers cocoanut to a *holi*. (88) The Sind Pārsi is a grocer who opens a shop if he but gets a few tubers of turmeric. (89) In the Marāṭha country the residents of the U.P. are called Purbhayas (from *purba* the East). Eight of them want nine fireplaces. Their *chauka*-system is well known, where every man will cook for himself and will not allow any other man to come near the place smeared up. In Gujerat they are called Purbias and the same proverb is used. (90) The Rājput is considered a great opium-eater in Gujerat. He will never be yours even if fed for a thousand years. The Rājput woman is fond of singing, and a song pleases a Rājput. A Rājput will start at a word. He is so alert. In the Marāṭha country it is said that the wall may slip out of the way, but the Rājput will not. In the battle-field he will not be beaten. He is needy. He is destined to meet dangers. He is not dirty, he brags, but he will always shine on the battle-field. (91) The Rangāri or dyer of the Maratha country is said to do what he likes. (92) Sāi, Merāi and Darji are the names by which tailors of different tribes are known in Gujerat. The Sāis sewing takes as many days as he likes. He steals cloth, he defies the watch of even the Angel of Death; great care is needed in entrusting any business to him. His evening never comes, he is a rogue. (93) When a Satal (stone mason) has no work he will try his hand on stones. (94) The Sāli or weaver is in requisition only when in plenty. (95) A Sett is a merchant in Kanara. His possessions, it is said, go to the son-in-law. He is a fool. He is useful only in towns. (96) The Shimpi or tailor in Kanara knows all about lies. He will always steal a bit of the cloth. (97) Sodha is a low class Rājput or Thākur in the Thar and Parker Districts of Sind and perhaps represents the Sondias of Sondwāra in Central

India. A Sondia knows how to retort when a Baniya tries to cheat him. (98) In Sind, the Sonar or goldsmith will steal gold even from his wife's nose-ring. In Gujerat he is called Soni. He can be watched by God alone! He takes much time over his work. He is a thief. He is nobody's friend. He is no relation even of his own sister, nor mother. He robs everybody and yet he is poor, he is requisitioned during prosperity. Whether one breaks old ornaments or makes new ones, the Soni is happy. He ruins ornaments by adding base metals. Never trust a Soni. (99) The Sutār or carpenter is given to gossiping. He saves chips for fuel. His wife gets no bracelets; she is poor. (100) The Teli or oil-man of the Marātha country is a poor drudge, like his bullock. In Kanara he is called Ganiga. Spare his hut, it contains his primitive mill. He is poor, but knows all about oil-producing plants. (101) The Tigala is a Tamil-speaking tribe of Kanara notoriously quarrelsome. You are advised not to tempt the mouth of a Tegāla woman, or she will beat a barking dog in howling. (102) In Gujerat, one Umarithi or native of Umareth is said to be equal to 9 Nadiādis and Petlādis. (103) The Vadāri is a poor Telegu-speaking tribe, very poor! (104) The Vaidu is a nomad herbalist, but he pretends to be a physician. (105) In Gujerat, the Vanjara or Banjara 'is an itinerant carrier.'

2. On Some Indian Ceremonies for Disease-Transference.

By SARAT CHANDRA MITRA, M.A., B.L.

People, in a primitive plane of culture, labour under the delusion that evil, in every shape and form, whether physical or spiritual, is an entity—a spirit or shadowy being—which can be transferred. This mode of thought was characteristic of almost all the nations of antiquity who, as a result thereof, had recourse to what was known among them as “ceremonies of riddance,” that is to say, ceremonies or rites by the performance whereof they believed they could rid themselves of all impending evils—all diseases and all misfortunes—and pass the same on to others. Take, for instance, the case of the ancient Greeks among whom this belief was so largely prevalent that the performance of this ritual of riddance was even one of the regular functions of the State itself. This is evidenced by the testimony of Plutarch himself who has recorded that, when he was archon of Chæronea, it was one of his official duties to superintend the performance of the following curious ceremony in which a large number of people participated. A household slave was taken to the public hearth of the city; and there he was struck with rods made of the stalks of the *Agnus castus* (*Vitex agnus castus*), a plant which was supposed to possess purifying properties as also the virtue of preserving chastity. Then he was expelled out of doors to the accompaniment of the words: “Out with hunger; in with wealth and health.” This ceremony was called the “Driving out of Hunger.” It was utterly unconnected with the regular worship of the deities of the ancient Greek Pantheon or even with the cult of the vaguest *theoi* which was a survival of the primitive Pelasgian ritual.¹ It was clearly based on that phase of primitive belief which is known to cultural anthropologists as “Sympathetic Magic.” In the same way, the ancient Israelites had their peculiar ceremony of riddance wherein the place of the slave was taken by a live goat which was known to them as the scape-goat (Lev. xvi. 8-10). It was performed as follows: Two goats were brought and offered to the Lord. Then lots were cast for ascertaining which of the goats should be sacrificed and which should be the scape-goat. The one which was elected for sacrifice as a sin-offering was slain. Thereafter the high-priest came forth from his *sanctum sanctorum*, placed his hands on

¹ *The Religion of Ancient Greece.*—By J. E. Harrison. London Archibald Constable & Co., Ltd., 1905. pp. 44-45.

the head of the live goat, and confessed over it the sins of the people. Then the sin-laden beast was sent out into the wilderness under the charge of a trustworthy person:—"And the goat shall bear upon him all their iniquities unto a land not inhabited" (Lev. xvi. 22).

These "ceremonies of riddance" are widely current in all parts of India at the present day. They are mostly had recourse to for transferring diseases or some other evil from one place or person to another. I have fully discussed elsewhere¹ the component elements of a North Indian charm by means of which a person suffering from some disease or tribulation seeks to pass it on to another by placing on the cross-ways certain objects which have come in contact with the former's body or which have been waved over him or upon which he has bathed.

One peculiar Indian form of this ceremony is that wherein the spirit of the disease—the malignant and invisible being which is believed to inflict it upon a locality—is sought to be compulsorily conveyed in a chariot or car from that place to another. This form is peculiar to Western and Southern India. It is, therefore, my intention in this paper to describe and discuss the different variants of this peculiar form of the disease-transference ceremony and bring out the salient features thereof.

In the Bombay Presidency, this mode of disease-transference is known as "*Matani Rath Kahadvi*" or "Conveying out of the village the chariot of the village-goddess." When plague, cholera and small pox rage in a village, the *rath* or chariot of the village-goddess, which consists of small pieces of wooden planks standing on wheels, and is decorated with small banners, is carried by one of the villagers in his hand; while some of the latter carry a cock and a goat in their hands, and others carry a cocoanut, betelnuts, cooked food and the like; the whole procession being led by a *Bhagat* or priest who chants several incantations all the while. The villagers make over the chariot to the inhabitants of another village, and return to their own with the delusion that they have transferred the epidemic, or for the matter of that the spirit thereof, to the latter village. The residents of this latter village, in their turn, pass the chariot on to another village, and so on. When the next village is far off, the transferring villagers place the *rath* or chariot in a place, which is hemmed in on all sides by hills, so that the disease-spirit being cooped up, as it were, may die out in solitude. When the last village, to which the chariot is conveyed, is situated on the sea-coast, the residents thereof throw the *rath*, and with it the spirit of the disease, into the sea where it is

¹ Vide my paper entitled "*A North Indian Disease-Transference Charm and its Panjabi and Persian Analogues*" which will be published in the *Journal of the Anthropological Society of Bombay*.

supposed to die of drowning. The goat and the cock, that are carried with the *rath*, are let loose; and it is believed that whoever will catch and take them away will contract the disease. When the procession starts, the women of the village meet near the village-well, light a lamp, and sing songs imploring the mercy of the village-goddess to them.¹

Curiously enough, an analogous custom wherein the disease-spirit is conveyed to another village in a cart or chariot dedicated to the village-goddess, also prevails in Southern India. Suppose cholera or small-pox has broken out in a village in the Telugu country. It is popularly believed that this outbreak of disease is due to the anger of the village-goddess Peddamma—the Great Mother. She, therefore, requires to be propitiated. Accordingly, a subscription is raised for the expenses of a festival, or a wealthy man offers to contribute all the expenses from his own pocket. An auspicious day, which may be any day except Sunday or Thursday, is selected for the performance of the worship. The potter is ordered to make a clay image of the goddess, and the carpenter to make a small wooden cart. While a male buffalo is selected as the chief victim for the sacrifice. We will suppose that the preliminary ceremonies (which are too complicated to be narrated here) have been performed; and the sheep, goats, fowls and buffaloes have been all sacrificed, the first three by the washermen by cutting their throats, and the buffaloes by the Madigas, the lowest class of the Pariahs. Thereafter the celebrants of the worship go to the house of the village-carpenter who has by this time got the small wooden cart ready. Arrived there, they offer some cooked rice to the cart (or more properly, to the disease-spirit thereon) and sacrifice a lamb before it. The carpenter is given his customary fee of a new cloth and eight annas. The washerman, then, drags the cart to the braying of horns and the rub-a-dub-dub of the tom-toms, to the place of sacrifice. After the performance of some other ceremonies which do not come within the scope of this paper, the image of the goddess is taken from the canopy by the washerman. A Madiga carries the head of the sacrificed buffalo with its foreleg in the mouth, the forehead and nostrils all smeared over with fat, and the earthen lamp still lighted on the top thereof. Then they all go in procession to the boundary of the village. The first man in the procession is he who carries the buffalo's head; next comes the washerman with the image. The rear is brought up by the small wooden cart. When they reach the farthest boundary of the village, they cross it and go over, for about a furlong, into the lands of the adjoining village. Arrived there, the Asadis first sing a long chant in praise of the goddess Peddamma.

¹ *Vide the Journal of the Anthropological Society of Bombay, Vol. IV, pp. 419-426.*

Then some turmeric (a spirit-scarer) is distributed to all the people. Lastly, the image is denuded of all its ornaments, solemnly placed upon the ground and left there. The light on the head of the sacrificed buffalo is put out; and the head itself is carried off by the Madiga. The image of the Great Mother is conveyed to the adjoining village in the belief that her wrath, which has caused the outbreak of disease, is transferred thereto. The wooden cart is supposed to carry the disease-spirit into the neighbouring village.¹

The second variant of this disease-transference ceremony is performed in some of the villages of the Telugu country nearer the sea-coast. Whenever an epidemic breaks out, the headman of the village gets a new earthenware pot, daubs it all over with turmeric-paste and *kunkum*, and places in its inside some clay bracelets, necklaces and ear-rings, three pieces of charcoal, three pieces of turmeric, three pieces of incense, a piece of dried cocoanut, a woman's cloth, and two annas worth of copper-pices. The pot is then hung up in a tree near the image, as a pledge that, if the epidemic subsides, the villagers will hold a festival in honour of the village-goddess. When it disappears, a shed thatched with palmyra-leaves is erected near the place where the image stands. A clay image of the goddess is specially made for this occasion, besmeared with turmeric-paste and *kunkuma*, and placed within this shed. An earthenware pot, filled with buttermilk and boiled rice, is placed below the image. This pot is also daubed all over with turmeric-paste and *kunkuma*, adorned with margosa leaves, covered with an earthenware saucer and carried by the village potter in procession through the village during the daytime to the obligation of the braying of pipes and horns and the rub-a-dub-dub of tom-toms. The potter takes the rice and buttermilk for his perquisite. This festival always lasts for an odd number of days, excluding all numbers with a seven in them, as for example 7, 17, 27, and so on. On the night before the day appointed for the offering of animal-sacrifices by the villagers, a male buffalo is sacrificed on behalf of the whole village. This is done by a Madiga who cuts off its head, if possible at one blow, over a heap of boiled rice which becomes soaked with its blood. The right foreleg is then cut off and placed crosswise in its mouth; the fat of the entrails is smeared over the eyes and forehead; and the head is placed in front of the image. A lighted lamp is then placed on the heap of rice soaked with the blood of the sacrificed buffalo. (I shall now pass over the ceremonies performed and the sacrifices offered during the intervening days, as they are beyond the scope of this paper). In the evening of the last day of the festival, a cart with eight

¹ Vide the *Madras Government Museum Bulletin* (Vol. V., No. 3). Madras: 1907. pp. 129-133.

pointed stakes standing upright at the four corners, and one in the centre thereof, is brought before the image. A pig, lamb or fowl is impaled alive on each of the stakes of the cart. A Mala, called a Pambala, and rigged out in the clothes of a woman, then sits in this cart and holds in his hand the clay image of the goddess. The cart is, then, dragged with ropes to the outermost boundary of the village and thence onward into the lands of the adjoining village, where both it and the ropes are left. The impaled animals, which have all died during the time the procession has been going on, are appropriated by the Pambalas as their perquisites.¹

The third variant of the foregoing ceremony is performed when an epidemic of cholera breaks out at Coconada in Southern India. A goddess called *Maridi-Amman* is installed; and her image is made by hewing a log of margosa wood, about three feet high and six inches in diameter, and by roughly carving its top into the shape of a head. [This bit of evidence supports, to some extent, Grant Allen's theory that all wooden idols or images have been, directly or indirectly, evolved from the wooden headpost or still more primitive sepulchral pole]. This wooden image is stuck into the ground; and a pandal of leaves and cloths is set up over it. Then the procession of the earthen pot half-filled with buttermilk and rice is led, every day, very much in the same way as at Masulipatam, until the epidemic disappears. Thereafter some ten or twelve small carts are constructed, about six feet square, with three pointed stakes standing up on each side thereof, on which living animals are impaled, as in other parts of the Telugu country. The carts are partly filled with boiled rice and curry-stuff prepared at the shrine, and the blood of the sacrificed animals is then poured over the rice. It is said that the live animals are impaled only when a cart, as it is dragged to the boundary, does not move properly. The cart's getting held up in this way is looked upon as an omen that the goddess is angry and requires to be propitiated further.²

The only analogue, which I have come across in modern European ritual, to the West and South Indian customs of driving off the disease-spirit in a car, is from Pithuria, the people whereof resort to a similar practice. Whenever influenza breaks out among them, they construct a small cart, yoke a pair of goats to it and drive it out into a forest. And it is believed that influenza will not break out again thereafter.³

Then we come across a fourth South Indian variant wherein the cart or "chariot of the goddess" is left out; and its place in the ritual is taken by a basket wherein the disease-spirit is

¹ *Op. cit.*, pp. 133-136.

² *Op. cit.*, p. 141.

³ Harrison's *The Religion of Ancient Greece* (Ed. 1905), pp. 44-45.

supposed to take its seat. This form of the ceremony is performed by the Canarese people of Mysore. Whenever small-pox, cholera, or cattle-murrain breaks out in a *grama* or *nad* (village), the inhabitants thereof set about to appease the wrath of the village-goddess *Mari-Amma*. With this view, they collect contributions of pigs, fowls, rice, cocoanuts, bread and plantains from the different householders of the afflicted village, and deposit the same at the *Mandu*. Thence they are carried in procession with the beating of tom-toms. There is one basket with some rice in it. As soon as it is taken to a particular house, the members thereof bring out a little rice in the hand, wave it round the head, and then throw it into the basket in the belief that the disease-spirit will depart with the rice. Last of all, the offerings are placed on the outermost boundary of the village; the animals are sacrificed and their blood is spilt over a stone; the basket with the rice is left there; and the remainder of the provisions is consumed by the persons composing the procession. The people of the adjoining villages repeat the same ritual; and thus the disease-spirit, which is causing the epidemic, is supposed to be expelled from the country. On occasions of still greater calamities, a flock of sheep is driven from village (*nad*) to village (*nad*) and, at last, banished from the country under the belief that the disease-spirit is also expelled with the sheep.¹

Then we come across an analogue wherein both the 'chariot of the goddess' and the basket, in which the disease-spirit is supposed to be seated, have been done away with. This variant of the ceremony is current in Northern India and that among a people in a low plane of culture, viz. the Oraons of Chota Nagpur. Whenever cattle-murrain breaks out among them, the bachelors of this aboriginal people perform a ceremony the object of which is to expel from the village the spirit which is causing the disease. As soon as a date is fixed for its performance, the village-kotwar informs all the villagers of it. On the evening of the day so fixed, all the families in the village leave one or more old earthen vessels in front of their huts. After their evening meal has been partaken of, all the householders, with the exception of the bachelors, shut themselves up within their huts and maintain strict silence. [This is an instance of the secrecy and tabu against speaking, which are the characteristic features of many of the rural ceremonies of Northern India.] At the dead of night, when the village is hushed in profound silence, the young bachelors gather together at the village-*akhra*, denude themselves completely of every stitch of clothing they have on, and take up, each of them, a cudgel in his hands. The cowherd of the village is

¹ Vide *The Madras Government Museum Bulletin* (Vol. V., No. 3). Madras: 1907. p. 159.

also present there, with a wooden cow-bell dangling from his neck or his waist. As soon as a certain signal is given, the bachelors, attired in nature's vestments, pursue the flying herdsman, uttering shouts very much like the lowing of cattle; and, in the course of their pursuit, they go on smashing to pieces, with their cudgels, all the earthenware vessels left outside the villagers' huts. If they chance to come across any person on the way, be he a co-villager or stranger, they give him a good drubbing with their cudgels. The same sort of scurvy treatment they mete out to whomsoever they happen to hear talking or breaking the silence of the night in any manner whatever. [This is another instance of the tabu against speaking which is a feature of North Indian rural ceremonies.] In this way they pursue their mad career on the pretence of giving chase to the cowherd. Arrived at the boundary of the village, the cowherd goes a little further on into the lands of the adjoining village, and there, in the twinkling of an eye, drops down his cow-bell and runs back. His pursuers, also, go up to the very place where the cowherd has dropped down his cow-bell, and leave their own cudgels there in the belief that the disease-spirit—the spirit which has been causing the cattle-murrain—has been expelled from their village. The people of the village, to which the disease-spirit has been transferred in this way, in their turn also, transmit it by a similar process to the village adjoining their own in the direction opposite to that of the other village. The ceremony is repeated in this way by each village, till it is believed that the disease-spirit has been completely expelled from the district.¹

The foregoing mode of disease-transference bears a striking resemblance to that pursued by the Canarese people of Mysore, only the place of the basket containing the charmed rice being taken by the wooden cow-bell and the cudgels into which the disease-spirit seems to have been compressed. The incident of beating with their cudgels any body whom the pursuers may come across in the course of their pursuit of the cowherd, recalls to mind the English practice of "beating the bounds" which Mr. Grant Allen would explain as being the last expiring relic of renewing the boundary-god every year by the sacrifice of a new victim. He says: "The bounds are beaten, apparently, in order to expel all foreign gods or hostile spirits; the boys who play a large part in the ceremony are the representatives of the human victims. They are whipped at each terminus stone, partly in order to make them shed tears as a rain-charm (after the fashion with which Dr. Frazer has made us familiar), but partly also because all artificially-made gods are scourged or tortured before being put to death, for some

¹ *The Oraons of Chota Nagpur.* By Sarat Chandra Roy. Ranchi: 1915. pp. 253-255.

reasons which I do not think we yet fully understand.”¹ The bachelors strip themselves completely naked, because nudity is an effective charm for driving off the demon of disease.²

From the idea of driving off the disease-spirit by such a ceremony as has been described *supra*, to that of driving away public calamities by undertaking a ceremonial expedition, is but an easy transition. In fact, we find, among the Oraons, the existence of the custom of undertaking ceremonial expeditions for the purpose of transferring, by means of magic, real or imaginary calamities from the country. These are known as *Rog-Khedna* (or “Disease-driving”) expeditions of which there are two variants—one being undertaken by the men, and the other by the married women.

Whenever it is known that some misfortune has befallen the cattle in a certain village, as, for instance, when it is rumoured that a cow has given birth to a pig, or that the plough-cattle are refusing to work when taken to the fields, the men have to undertake the “disease-driving” expedition. But the Oraon women have to undertake it, when rumours are rife to the effect that certain females among them have given birth to animals or fowls or monstrous children. Before starting, the women of every family sweep the floors and courtyards of their respective houses and besmear them with cowdung and water. [Note that both cowdung and water are spirit-scarers.] The sweepings are then thrown into the nearest stream or pool of water. Thereafter the women return home and bathe. In some villages, the Pahan or his wife burns incense in his house. Then the men or women, as the case may be, go their rounds from house to house in their own village, carrying with them one or two bamboo-baskets, a brass *lota* and a few mango-twigs (a well-known spirit-scarer), and receive from each householder a handful of rice or *marua* (*Eleusine coracana*). [Note that grains are spirit-scarers]. Then they go to the next village in the direction opposite to that in which the rumoured calamity is said to have taken place. Arriving at the next village, they repeat the same process of begging for rice or *marua*, handfuls of which they receive in their baskets. Then they proceed to a second village in the same direction and collect rice and *marua* in the way described before. When they have finished begging for doles of rice and *marua* in three villages (including their own), they go, at midday, to some secluded spot on the outskirts of the last village they have visited, and there cook as much of the rice or *marua* as they require for their midday meal, and partake of it. The remain-

¹ *The Evolution of the Idea of God*. By Grant Allen. London : Watts & Co. 1911. p. 100.

² Crooke's *An Introduction to the Popular Religion and Folklore of Northern India*. (Ed. 1894). p. 41.

der of the rice and *marua* are sold, and, with the sale-proceeds thereof, liquor is bought which they drink and then return home. On the following day, the men or women, as the case may be, of the villages visited on the preceding day undertake a similar "disease-driving" expedition in the same direction. In this way, the rumoured calamity is expelled from village to village till it is altogether driven out of the Oraon country. While going on such expeditions, the men are headed by the village Pahan, and the women by the latter's wife and a few other elderly women of the village. A similar "*Rog-Khedna*" expedition is also undertaken whenever a woman happens to drive a plough, for by reason of her so doing, it is apprehended that drought and famine would overtake the Oraon-land.¹

We will now compare all the aforedescribed variants of the disease-transference ceremonies. As the result of comparison we find that:—

(a) In some cases, the spirit of the disease is supposed to be transferred to a cart or chariot which is conveyed to the next adjoining village to which it is believed to be transferred.

(b) In one case, the disease-spirit is supposed to be confined in a basket which is taken to and left in the next adjoining village to which the disease is believed to have been passed on.

(c) In one case from Northern India, the disease-spirit is believed to be compressed into a wooden cow-bell or into cudgels which are taken to, and dropped down upon, the lands of the next adjoining village. It is believed that the disease is thereby transferred to the latter.

(d) In another case, a similar process is, by analogy, resorted to for warding off or expelling public calamities.

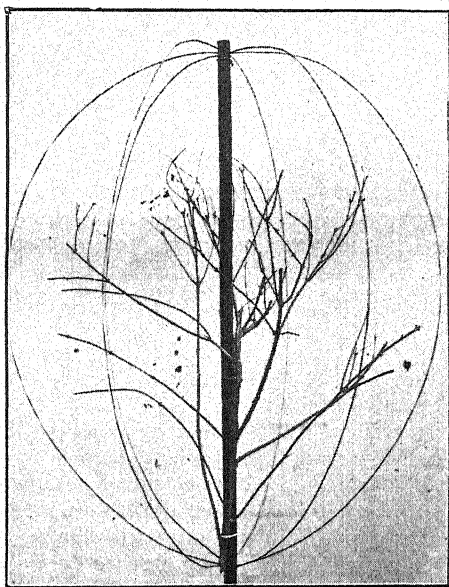
¹ *The Oraons of Chota Nagpur.* By S. C. Roy. Ranchi: 1915. pp. 269-272.

3. Notes on the Habits of *Cyrtophora citricola*.

By W. H. PHELPS.

My claim to attention rests on my intimate acquaintance with the individual specimens of the common spiders of Calcutta, which I have been keeping under careful observation, making accurate daily notes.

I adopted a method of keeping the weavers under observation by using a kind of open cage. The accompanying figure illustrates the kind of "cage" I used.



For the first twelve months I was principally engaged on *Cyrtophora citricola*, dealing with specimens which I had collected in my garden. They being nocturnal and shy of artificial light, it was a year before I was fortunate enough actually to see a snare made. Indeed it was not until I had reared some of them that I got specimens that would work in the light of an electric reading lamp.

The markings of the body are different in different individuals, and the colour varies in the offspring of the same mother, and in the same brood, from black to putty colour and there may

even be reddish markings. To an experienced eye the individuals are recognizable just as are members of a family of close-haired dogs, and their hairy skins heighten the resemblance, when seen under a microscope.

Cyrtophora citricola will build as many as twelve cocoons, each containing about 75 eggs, which hatch out as a rule in 16 days. The interval between building the cocoons is as a rule 4 days. Directly the young quit the nest they are capable of spinning.

During the 4 days' interval before the arrival of the next brood they build a little snare about $1\frac{1}{2}$ inches in diameter, exactly like their mother's. Then they aviate, and, if in a verandah, make their way out into the world—but not to the interior of the house.

They cast their skins twice during the first month or so, and twice more before they are full grown, which they become in two or three months from birth. The rate of growth varies in individuals and depends to some extent on the amount of food they get. They live 5 or 6 months.

Fabre denies any sense of property in spiders, but I find it is very marked. As every Englishman's house is his castle, so every *Citricola's* snare is regarded as sacrosanct, and it is very rare for one specimen to invade the snare or to attempt to steal or misappropriate the property of another.

If a fly or grub, for instance, falls on to a snare, it is taken by the owner, and she is left in peaceful possession, but if it eludes the grasp of the owner and falls on the foundation lines, which are common property, it comes into play again, and the first to seize it is then regarded as the owner. There is no scuffle after it is once fairly seized. There is much evidence on this point recorded in my diaries. Once or twice I have noticed an exceptional departure from the path of rectitude, but we may notice this is in higher forms of life!

The web of *Cyrtophora citricola* resembles the webs of other species of *Cyrtophora* in the finer details of its structure, but cannot be confused with them as regards shape, being practically flat, with at most a slightly elevated cone in the centre, instead of being dome-shaped. I hope to be able to describe later the method used in the construction of the dome-shaped web of *C. ciccatorosa*. For the present I need only say that the methods of *C. citricola* and *C. ciccatorosa* are not altogether the same.

All the European Arachnologists I have read award the palm for spinning to the garden spider or some other species of *Epeira* which builds "cart wheel" snares. The cart wheel or perpendicular snare with its radial spokes emanating from the centre and carried on to the circumference is a high work of art and very beautiful, and deserves a good deal of the praise which has been bestowed on it, but the web of *Cyrtophora citri-*

cola, with its mesh of 25 to the inch, and lines so fine that it is difficult to see them individually except in a strong light, bears about the same proportion in the matter of fineness to the cart wheel snare as a piece of the finest Dacca Muslin to a fishing net! And well it may; for the cart wheel is generally made in 40 to 45 minutes including the foundation lines, whereas *C. citricola's* snare, after the foundation lines are provided, takes 5 hours of continuous toil to make.

Having laid out some of the radiating lines on which she purposes to weave the horizontal sheet, she will commence from the centre to lay spiral lines and work round and round till she has prepared a disc of about the size of a rupee. During her progress on the circle she will from time to time suddenly leave the centre by one of the spokes, carrying a new radial line which she attaches to the line at the outer edge of her snare, and instantly return with another line stretching from the periphery to where she left off. Then she will resume her circular work to and fro on a segment of the inner circle, and suddenly dart out in another direction to the periphery and back again, and resume her work on the ever-growing inner circle, all without the slightest hesitation. You will observe the line she runs on bends with her weight.

In one respect the movements, as regards precision and accuracy and rapidity, are machine-like; but the work is not that of a machine; there is nothing automatic or tiresome or monotonous about the action, but it is rather the work of a sentient, calculating, thoughtful being. She does not go round and round with tiresome iteration, but attends to some part or segment of the circle—now with her right side to the centre, then returning over the segment with her left side to the centre. Anon she walks sideways with her head towards the centre, and in the meantime she now and then leaves the circle and runs out two more spokes—one on the outward run and one on the inward run.

Perhaps, when the woven circle is about $2\frac{1}{2}$ ins. across, she will suddenly return to the centre and do something that is not immediately apparent, but when after a minute or so she returns to her circular weave again, you will notice with astonished delight that she has drawn down the suspensory threads and shortened them, and lo, there is the raised cone of the bell-tent!

It will be noticed that the spokes (the radiating lines) are thicker than the spiral weaving lines. The latter are so thin that they are utterly invisible, unless seen in a bright light. It will be observed also that *not all* the spokes terminate in the centre like the spokes of a wheel do in the hub. This is why she breaks off her circular peregrinations to run out a new couple of spokes as required for if all emanated from the centre they would be too far apart at the outer edge of the circle.

If the web gets damaged the spider knows how to repair it. I once made a hole in one of these webs, through which a golf ball might have been passed with ease. This was done at about 7 P.M. At 9 P.M. I noticed that the ragged edges of the rent had been roughly drawn together, and by 11 P.M. some more work had been done, in such a position that I could not observe any details; but *in the morning the hole had been darned*; not as well as the original weave, but still a distinct darn, and the violated circle had been restored.

4. On Secrecy and Silence in North Indian Agricultural Ceremonies.

By SARAT CHANDRA MITRA, M.A., B.I.

If we examine the ceremonies performed in different parts of Northern India in connection with various agricultural operations, we find that some of these are characterized by two striking features, namely, *that these must be performed by the celebrants either without speaking or in profound secrecy*. These taboos against speaking and the presence of outsiders are observed at the times of (a) sowing the seeds, (b) threshing the harvested crops, (c) winnowing the threshed-out grains, (d) heaping up the cleaned grains and (e) measuring the same.

This taboo against speaking is based on the belief that, if any talking is done or even if an ejaculation of any kind whatever is uttered, ill-luck would overtake the celebrants of the ceremonies, for evil spirits would come and deprive the corn of its substance and nutritive properties.

We should, first of all, discuss the taboo against speaking as it is enforced in connection with sowing operations. We find that, among the Orāons of Chhota Nagpur, this vow of silence is strictly observed at the time of sowing the paddy-crops. Shortly after midnight preceding the day selected for the commencement of sowing the paddy-field, an adult male Orāon cultivator goes to one of his fields with a small quantity of paddy-seeds, and, while going there or while he is engaged in sowing the seeds, takes special care that he is not seen by anybody else. Even should he come across some other person while on his way to the field, he does not speak to him. Then again, even if he is accompanied thither by another person, they do not usually talk to each other; or, should there be any urgent need for talking, they do so in undertones. The Orāons superstitiously believe that, should any person happen to see the cultivator going to the field and mumble to himself the words: "Look! The man over there is going to sow his fields," the utterance of this remark, or even the rising of this thought in the former's mind, would exercise a baleful influence on the paddy-crops and prevent them either from growing vigorously or yielding a bumper harvest.¹

Let us, then, examine the taboo as observed in connection with the threshing ceremonies of Northern India. Whatever

¹ *The Orāons of Chhota Nagpur*. By S. C. Roy, M.A., B.L. With an Introduction by Dr. A. C. Haddon. Ranchi: 1915. pp. 141-152.

may be the way in which these rituals may be performed, during the whole time that they may be going on, the most profound silence is observed and must not on any account be broken within the precincts of the threshing-ground until the threshed-out corn is measured and distributed.

If we go to the Panjab and the United Provinces of Northern India, we find the custom existing there of distributing what is known as *अंगूंगा* (*انگورنگا*). When the reaped corn is being threshed out on the threshing-ground, small quantities of the threshed-out grain are distributed to the village deity, the *guru* or spiritual preceptor, the *purohit* or family-priest, the Brahman and the village grazier. These perquisites are known as *angounga* in the United Provinces, as *seaoodee* or *thapa* in the extreme North-West of India, and as *anjali* (*अंजली* or *انجلى*) in Bundelkhand. During the interval commencing from the distribution of the *angounga* to the time when the threshed-out grains are weighed, a profound silence is observed and strangers are not allowed to be present at the scene of the threshing operations. With so much rigour is this taboo against the presence of outsiders enforced that it is said that, on one occasion, a criminal happening to come to the threshing-ground, the threshers, who were vowed to observe the strictest silence, simply beckoned to the former to go away so that he might not profane the hallowed ceremony with his presence. As the result of their strict compliance with the taboo against speaking while the threshing operation was going on, they were hauled up before a Magistrate for having connived at his escape.¹

This taboo, however, is observed during the preliminary stages of the threshing operation in some parts of the Benares and Delhi Divisions and of the North-Western Province. When the harvested crops are about to be gathered into a heap, a man sits down with a ploughshare in his hand which he sticks into the ground and on each side whereof some *kusa* grass and cow-dung are placed. [Note that both of these are spirit-scarers.] Thereafter another man, from behind the back of the person seated on the ground, throws some corn over the latter's head. Then the man sitting on the ground places this corn all round the ploughshare and, during all the time that he may be doing it, takes the precaution that this operation is not seen by any outsider. When the ploughshare has been completely covered up with this corn, the man seated on the ground stands up; and thereafter all those, who are present on the threshing-ground, render assistance in heaping up the harvested crops.²

¹ *Supplement to the Glossary of Indian Terms.* By H. M. Eliot, Esq., B.C.S. Agra: 1845. pp. 19-20.

² *Op. cit.*, p. 20.

This ceremony, however, is performed with some slight variations in the Rohilkhand Division. After a *hom* or religious ceremony has been performed by lighting a sacrificial fire, a ploughshare and a pot full of water are placed to the north of the threshing-pole round which the oxen are driven to tread out the grain. The threshed-out grain is then heaped up to the south of the ploughshare stuck into the ground, and not over it as is done in the Delhi Division.¹ [Compare this lighting of sacred fire with the offering of fire which is made, in the district of Bareilly, to the heap of winnowed grain].²

We shall now discuss the several component elements of the aforementioned ceremonies, namely, (a) the sticking of the ploughshare into the ground; (b) the act of covering up the ploughshare with the corn without its being seen by a stranger; (c) the lighting of a fire; and (d) the placing of a pot full of water.

(a) The virtue of "cauld iron" as a spirit-scarer is well-known. The ploughshare is stuck into the ground for the purpose of scaring away the evil spirits which may come and take away from the grains their substance and nutritive qualities. This is paralleled by the English housemaid's practice of placing the poker across the bars and pointing up the chimney in order to make the fire burn. Then, again, whenever there is difficulty in butter-making, which is believed to be due to thwarting by the mischievous sprites "that bootless make the breathless housewife churn," the English housewife plunges a red-hot poker into the milk.³ The belief about the evil spirits stealing the corn is widespread. In the folklore of the English peasantry, flying dragons, dwarfs, fairies and witches purloin the corn from the fields and convey it through the air to other people. Similarly, a demon or wizard armed with sickles on his feet is believed to visit the fields of ripening corn, cut down the crops and appropriate the same.⁴ In a Danish folktale, the elves are described as clipping off the ears of rye from a rye-field.⁵

(b) The act of covering up the ploughshare with corn is done secretly in order to avert the evil eye of strangers or of "eye-biters" as an Irishman would say.

(c) The fire is also a spirit-scarer and lighted to drive off mischievous sprites who may be loitering about to cast harmful spells on the harvested crops. This is similar to the English

¹ *Op. cit.*, p. 20.

² *Bareilly Settlement Report*. By S. M. Moens, Allahabad: 1874. p. 78.

³ *An Introduction to Folklore*. By M. R. Cox. London: David Nutt, 1897. pp. 7-8.

⁴ *The Handbook of Folklore*. By G. L. Gomme. London: David Nutt, 1890. p. 107.

⁵ Hartland's *The Science of Fairy Tales* (Edition of 1891), p. 67.

peasant's practice of running through the fields with lighted torches or bunches of straw or of kindling bonfires therein.¹

(d) The potful of water is placed near the heap of corn as water is a protective against the influence of evil spirits, which is the root-idea underlying all the numerous bathing and lustration ceremonies performed by the orthodox Hindus throughout India.

Then I have to deal with the ceremonies performed on the occasion of winnowing the threshed-out grains. In several parts of Upper India, especially in the district of Hoshangabad in the Jubbulpur Division, C.P., the operation of winnowing is looked upon in the light of a very solemn rite and is not undertaken until a very auspicious moment for beginning it is selected by the village astrologer. When this has been done, the agriculturist, with his whole family and the entire staff of his farm-hands, betakes themselves to the threshing-ground and takes with them milk, butter, turmeric (a well-known spirit-scarer), boiled wheat, several kinds of grain (another scarer of evil spirits) and other requisite articles of worship. The threshing-floor stake is then washed with water [which is a protective against the baleful influence of malignant spirits]. Thereafter the offerings of the aforementioned eatables and drinkables are made to the stake and the heap of threshed-out grains, the boiled wheat being scattered about to appease the malignant demons hovering about—as a sop to coax them from purloining the harvested crops. [Compare this practice of scattering boiled wheat with the Japanese custom of scattering dried peas through a house on the eve of the Setsuban festival-day, to the accompaniment of the cry “Devils out! Good fortune in!”]. Then the farmer takes his stand on a three-legged stool and, taking five basketfuls [Note that five is a sacred number] from the heap of threshed-out corn, winnows the same. After the winnowing has been done, the grain and chaff are again collected and measured. If these exactly fill up the five baskets, or anything remains over after they have been filled up, it is considered an omen of good. Should these not fill up the five baskets exactly, the place of winnowing is considered unlucky. Thereupon he removes a few yards off to another part of the threshing-ground, the five basketfuls of grain, which are kept separate from the remainder of the harvested crops, are presented to a Brahman or distributed to the villagers. Thereafter, the winnowing operation is resumed and carried on without any ceremony but with this much precaution only, namely, that, as long as the winnowing-operation goes on, the basket must not, on any account whatever, be placed on its bottom but should always be put upside down. [The celebrants explain this by saying that, if this were not

¹ Gomme's *The Handbook of Folklore* (Edition 1890), p. 103.

done, the evil spirits would carry off the grain in these baskets standing on their bottoms]. The winnowed grains are usually measured in the evening. [This is one of the auspicious times, among the peasantry of the Eastern Panjab, for commencing the measurement of the cleaned grain. *Vide* my remarks *infra*]. *The measurement is made with profound silence.* The measurer sits with his back turned towards the unlucky quarter of the sky and keeps an account of the number of basketfuls measured by tying knots. [An instance of the primitive method of computation—similar to the Santali method of using knotted cords as calendars].¹ It is popularly believed by the peasantry of these parts that the malignant sprites cannot purloin the grains after they have been measured.² [In Karnal, however, it is believed that, as soon as the winnowed grains have been measured, they become perfectly immune from the effects of the evil eye. *Vide* my remarks *infra*].

Next we have to discuss the taboo against speaking as it is observed in connection with the ceremonies for heaping up the grain after it has been cleaned by winnowing. In the eastern districts of the Panjab, especially in Karnal, the winnowed grain is gathered into a heap with a good deal of precaution, for otherwise it is apprehended that the malignant sprites will rob the same. One man sits with his face towards the north and, sticking a ploughshare into the earth, places two round balls of cowdung on the ground on either side of it. [Note that cowdung is a spirit-scarer]. This plough-coulter is said to symbolize *Shāod Mātā* or the "goddess of fertility." Then a branch of the *akh* or gigantic swallow-wort [Sanskrit, *arka*; Bengali, *ākanda*; and Hindi, *mādār* (*Calotropis gigantea*)—a sacred plant, as in the Lower Himalayas, a person, desiring to marry a third time, has to marry it before he can be united in wedlock with his third human wife] and some shoots of the *dub* grass [another spirit-scarer] are offered to it. Then the celebrants salute the symbol of the goddess with the utterance of the following prayer: "O Mother Shāod! Give the increase and make our rulers and bankers contented." The man seated on the ground then hides the symbol from the gaze of all on-lookers and, at the same time, covers it up with the grain which other persons present there throw over his head from behind his back. [This is very similar to the rites described *supra* as performed in some parts of the Benares and Delhi Divisions during the preliminary stages of the threshing operation]. When it has been covered up completely, the other celebrants heap the cleaned grain upon it. While they are

¹ *Vide* my *Further Notes on the Primitive Method of Computing Time and Distance* in the *Journ. Anthropol. Soc. of Bombay*, Vol. IX., pp. 86-87.

² *Settlement Report of Hoshangabad*. By Sir C. A. Elliott. Allahabad: 1867. pp. 78 ff.

doing this, the man seated on the ground gets up, takes his stand to the south of the heap and circumambulates it thrice—by going westward during the first and third times, and by going eastward on the second occasion. While he is circumambulating it, he keeps his hand farthest from the heap of grain, while with the other he holds a winnowing-fan,¹ and taps the heap with it. When the heaping operation has been finished, all the celebrants sprinkle the heap of cleaned grain with Ganges water [Note that water is a protective against the influence of malignant spirits. Also compare the act of sprinkling with Ganges water with the placing of the pottful of water to the north of the threshing-pole preliminary to the threshing operation in the Rohilkhand Division. In the Bareilly district, however, after the offerings of fire, butter and coarse sugar have been made to the heap of winnowed-out grains, *water is poured all round it*, and the whole ceremony is wound up with the distribution of the sugar to those present].² salute it and then cover it up with a cloth [presumably to protect it from the evil eye of the “eye-biters”]. It is allowed to remain thus till the time for measuring the cleaned grain comes. Thereafter a line is drawn upon the ground and all round this heap, inside which charmed circle none may go save and except the man who will measure the cleaned grain. *It is a sine qua non of all these rites that they should be performed with the strictest silence.*³ The act of circumambulating the heap of winnowed grain thrice is known as performing the ceremony of *Chāng* or *Chānk* (चांक or چانک).

In the Etawah district of the U.P., however, the aforementioned rites are performed with some variations. The cultivator places, three spans off to the north of the heap of winnowed grain, a threshing-floor rake, a bullock's muzzle, and a rope. [I am unable to make out the significance of these three articles]. Thereafter, in the space between these articles and the pile of grain, he places a small offering composed of some ears of grain, some leaves of the gigantic swallow-wort and a few flowers. [Note that the swallow-wort is a sacred plant: and the flowers and the ears of corn are scarers of evil spirits⁴]. This offering is placed on a piece of cowdung cake. [Note that cow-dung is a spirit-scarer]. Then he covers up the heap of grain with a cloth presumably to protect it from the baleful

¹ For the magical powers popularly ascribed to the winnowing-fan, vide my article “*The Worship of the Earth-Mother*” in the *Hindustan Review* (Allahabad) for July 1916, page 55.

² *Bareilly Settlement Report*. By S. M. Moens. Allahabad: 1874. p. 78.

³ *Vide the Karnal Settlement Report*. By J. Wilson. Lahore: 1886. p. 173.

⁴ Crooke's *An Introduction to the Popular Religion and Folklore of Northern India* (Allahabad Edition of 1894), pp. 182, 206, 209; pp. 200-1,

influence of malignant spirits and from the evil eye of the "eye-biters." Thereafter he places in a basket three [Note that three is a sacred number] handfuls of grain as the perquisite of the village-priest who kindles the fire at the Holi festival. He also puts aside a small quantity thereof for the beggars of the village. [This is similar to the custom of distributing the *ang-ounga* described *supra*]. Subsequently to this, he throws some grains over the cloth, and, filling up a basket with grains, pours back the same over the heap. He then makes an obeisance towards the north—apparently the abode of the deities—and mumbles a prayer, thereby breaking the taboo against speaking which is strictly observed throughout the performance of the aforementioned rites. The cloth is thereafter removed from off the pile of cleaned grains; and the whole ceremony is thus brought to a close.¹

The *Chāṅk* (चाँक) is performed with a good deal of variation in the Upper Doab and Delhi Division. After the ceremonies preliminary to the stacking up of the harvested crops have been performed, and after the heap has been raised to the height of about a foot, a person takes his stand with his face pointing northwards, takes hold of a winnowing-basket with his right hand and, in his left, puts a handful of grain. Then he circumambulates the heap, beginning from the south, going round from west to east and onwards to the south again, and, at the same time, presses the basket against the lower portion of the heap. This circumambulation is usually made thrice. But if the heap is very high, so many as five or even six circuits are made. When the stack of the harvested crops attains a height of about three feet, the hands of the circumambulator are changed, the winnowing-basket being taken in the left hand, and the grains in the right. Then the circuit of the stack is again made thrice, this time in the direction contrary to that of the first occasion, that is to say, commencing from east to west. While the circuits are being made, the circumambulator presses the winnowing-basket against the bottom of the heap. When the stack is raised to the height of about five feet, the hands are again changed for the second time; and the same ceremony of circumambulation round the heap is made thrice as on the first and second occasions with this much difference only, viz. that this time the winnowing-fan is pressed against the top of the heap.

In some places, however, the ceremony of *Chāṅk* is not performed until after the whole of the harvested crops has been stacked up into a complete heap which, as usual, is circumambulated thrice successively in the aforementioned order, that is to say, the first circuit being made from west to east, the

¹ *Op. cit.*, pp. 385-6.

second from east to west, and the third again from west to east. When, at the conclusion of his last circumambulation, the celebrant again arrives at the south of the heap, he places the winnowing-basket on the ground in front of him and, joining the palms of his hands together, makes a low obeisance to the stacked corn and mumbles any one of the following prayers :—

स्यावढ परमेश्वरजी ।
सै बर्कत दीजिये ॥

Translation.

O god Syāwadḥ !
Grant me a hundredfold good fortune.

Or,

अन्न देवताजी ।
सहेस गुना द्दजिये ॥

Translation.

O god of crops !
Pardon my sins.

Or,

सहदेवन गोशाहन हमको तुम राज बयौहर कैसे
उरगिन करो

Translation.

O Gosāin Sahadewan ! Make me as prosperous as the “ King of Merchants ” (*Rāj Bayouhar*).¹

Several points in the aforementioned prayers call for some notice. In the first prayer, the god Syāwadḥ (स्यावढ परमेश्वरजी) or the “ god of fertility ” is invoked. He is apparently a male deity. But in the ceremony as performed in Karnal, Shāod Mātā (Mother Shāod), the goddess of fertility, is prayed to for granting prosperity to the worshipper. I think that Gosāin Sahadewan invoked in the third prayer is the same as the deity Syāwadḥ of the first one. In the second prayer, the god of crops (अन्नदेवताजी) himself is invoked. As regards the “ Rāj Bayouhar ” (राज बयौहर) or “ the King of Merchants ” mentioned in the third prayer, I invite the reader's attention to the Beohār Bābā² or “ Lord of Merchandise ” who is worshipped

¹ *Supplement to the Glossary of Indian Terms.* By H. M. Elliot, Esq., B.C.S. Agra: 1845. pp 130-132.

² Crooke's *An Introduction to the Popular Religion and Folklore of Northern India* (Allahabad Edition of 1894), p. 159.

with pots of holy water and some greenery in a village of the Mirzapur district, U.P.

In the Rohilkhand Division, however, quite different variants of the foregoing ceremony are performed. In the northern portions of this Division, a man, taking a winnowing-basket in his right hand and with nothing in his left one, goes from the south towards the west and thence towards the north till he reaches the *merh* or threshing-pole. He then retraces his steps by the same way to the south, and thence walks towards the east and then to the north till he arrives at the *merh* again. From this goal he goes back by the same route, that is to say, from the north to the west and thence to the south. Having again reached the southerly point, he places the winnowing-fan on the ground and makes a low bow to the accompaniment of some religious invocation. [This way of circumambulating the heap of harvested crops is exactly similar to the mode of making the circuit round the heap of winnowed grains as is prevalent in the district of Bareilly¹]. In the southern parts of the same Division, the celebrants of the ceremony usually press their hands in six different parts of the heap of the harvested crops, commencing from the bottom thereof and ending at the top of the same. Each time that the heap is touched with the hand, the name of one of the *Chakravartī Rājās*, namely *Māndhātā*, *Ben*, *Datīp*, and so forth, is mentioned.²

In the Lower and Central Doab as also in Sagor, the *Chāṅk* is usually performed by simply drawing a circle with cow-dung (a spirit-scarer) or ashes round the *ras* and *thapa* simultaneously. The line is commenced from the east, on to the south, and thence to the west and north and from there to the east again. While the circular line is being drawn, the man making it takes care to hold his breath. Sometimes, the circular line is again continued from the easterly point up to the southernmost one, thus a second complete circle not being formed. The reason for leaving the part from the east to the south is that the perquisites for the deities and the Brahmans are taken therefrom and laid aside.³

In many other localities, the ceremony of circumambulating the *thapa* or the heap of grains formed for the village servants, varies to some extent from the foregoing one. The celebrant commences his circuit from the south, thence to the west, and then on to the north from whence he retraces his steps by the same way to the south again. He takes care not to place his footstep anywhere on the eastern side of the

¹ Bareilly Settlement Report. By S. M. Moens. Allahabad: 1874. p. 78.

² Elliot's Supplement to the Glossary of Indian Terms (Agra Edition of 1845), p. 132.

³ *Op. cit.*, p. 132.

heap, because that side is the *amun* or *kand* which contains the refuse of the corn (set apart for the *chamars* or leather-curiers of the village), which having fallen behind the winnower is of a very inferior quality.

*The whole ceremony of Chāṅk is performed with the profoundest silence, which taboo against speaking is strictly observed till the cleaned grain is measured and distributed. The reason popularly ascribed for the observance of this taboo is that, if any talking is done while the ceremony is being performed, the malignant spirits, who "bootless make the breathless housewife churn," injure the grains.*¹

We have already seen that the heap of winnowed grains in Karnal, and the stack of harvested crops in the Upper Doab and Delhi Division are circumambulated by the performer of the *Chāṅk* ceremony thrice. While in the Rohilkhand Division, the circuit is made twice only. We have also seen that the initial circuit is always commenced from the east or south on to the west and north, and then to the east or south again. It will be noticed that this movement is in imitation of the sun's apparent diurnal course from east to west. This rite of sunwise circumambulation is a vestige of sun-worship, and is had recourse to because, by his genial warmth, the sun exercises a beneficial influence on the vegetable products of the earth. Numerous vestiges of this sun-worship exist in the customs of the European peasantry. The Irish peasant crawls thrice round the healing spring in imitation of the sun's apparent diurnal course.² Similarly, when a Highlander goes to bathe in, or to drink water out of, a holy spring, he always approaches it by going round the place from the east to the south and thence to the west. This is called in Gaelic going round the right, or the lucky way.³ In the Highlands of Scotland also, the custom of "making the deazil" or of walking sunwise thrice round a person to whom the performer wishes well, exists even at the present day. Even in the farthest Hebrides, animals are led round an invalid following the sun's course.⁴ Many such traces also survive in Indian ritual and custom. The bride and bridegroom walk round the sacred fire or the central pole of the marriage-shed in imitation of the sun's course. A Hindu worshipper circumambulates a temple or shrine in the same way. Sunwise also move the oxen round the threshing-pole as they tread out the grain on the threshing-ground.

¹ *Op. cit.*, pp. 132-133.

² Cox's *An Introduction to Folklore* (Edition 1897), p. 20.

³ Elliot's *Supplement to the Glossary of Indian Terms* (Agra Edition of 1845), p. 131 (footnote).

⁴ *From the Hebrides to the Himalayas*. By Miss C. F. Gordon-Cumming. 2 vols. London: 1876. Vol. II., p. 164. Also W. Henderson's *Folklore of the Northern Counties*. London: Published by the Folklore Society. 1879. p. 61.

Then we have to deal with the ceremonies connected with the measurement of the cleaned grain, and the vow of silence which is strictly observed during the performance thereof. Throughout Northern India, there exists the curious custom of placing a round cake of cowdung, which is known in the districts to the east of Allahabad as *badhāwan* (बढ़ावन or بڑھاوان) or "that which gives the increase," on the top of a heap (*ras*) of grain to protect it from the evil eye of "eye-biters" and for the sake of good luck in order that the grains may increase (बढ़े).¹

Sometimes, a magic circle is drawn either with fire or water all round this heap, the man making the circle observing the strictest silence. In the district of Bareilly, however, the circular line is drawn with cow-dung (a spirit-scarer).² In the districts situated to the west of Allahabad, this covering placed on a heap of winnowed grain goes under the appellation of *Chhatur* (बहुर or چھتر from the Hindi बहुर or چھتر an umbrella) and consists of a blade of grass, or a dry branch of arhar or pigeon pea (*Cajanus indicus*) with several (usually five) projecting twigs, on each of which a small lump of cow-dung is put, or a flower of the *akh* or *madar* (*Calotropis gigantea*—a sacred plant). In the Bareilly district, an iron sickle, a blade of the sacred *kusa* grass and a twig of the gigantic swallow-wort, with a cow-dung cake in a cleft stick [Note that all these four articles are spirit-scarers] are put on the top of the heap; while four cowdung cakes are placed at the four corners thereof.³ Sometimes, a spear is stuck into the ground—not on, but at the side of, the heap. Occasionally, an artificial flower is placed at a short distance from the bottom of the heap. The *Chhatur* is put on the heap of grain with the same object as the *badhāwan* is, namely, to prevent the harmful effects of the evil eye or of the praises of any casual visitor.⁴

¹ Those, who scoff at the superstitious belief in the efficacy of the *badhāwan* as a charm for increasing the heaped-up grains, recite the following satirical stanza :—

1. जग बौराहा चिन्ना बिबस भूत पूज भावलेय ।
2. बढ़े न बढ़े बढ़ावना जन किसान रचदेय ॥

Translation.

1. The world is mad and worships the evil spirits out of avaricious motives,

2. And places the *badhāwan* (on the heap of grain), no matter whether (the heaped-up grains) increase or not.

² *Bareilly Settlement Report.* By S. M. Moens. Allahabad: 1874. p. 78.

³ *Op. cit.*, p. 78.

⁴ *Elliot's Supplement to the Glossary of Indian Terms.* (Agra Edition

Now four men with a wooden measuring vessel go inside the magic circle which has been drawn all round the *ras* or heap. Anybody else must not come near them till they have completed the measuring operation. They take their seat on the ground with their faces turned towards the north and spread out a cloth on the ground. One man fills up the measure from the heap with the aid of the winnowing-fan; another pours out the contents of the measuring-vessel over the cloth; and the two others carry off the cloth full of grains and drop out the contents thereof, substituting an empty cloth for the one which has been removed. The man, who has got the measuring vessel with him, puts down for each measure filled up, a small pile of grains wherewith the account is kept. [This is an instance of the primitive method of counting]. *Profound silence is observed until the entire measuring operation is completed. All counting aloud of the number of measures is strictly prohibited.* As soon as the measurement of the grain has been finished, it becomes perfectly immune from the effects of the evil eye.¹

In the eastern parts of the Panjab, the measurement of the grain must not be made, on any account whatever, on the day of the new or full moon, nor on a Saturday which is inauspicious for its performance. The measurement must be commenced at dawn, midday, sunset, or midnight when the malignant spirits are busy with something else²—

“For then, they say, no spirit dares stir abroad:
No fairy takes, nor witch hath power to charm;
So hallowed and so gracious is the time.”

Hamlet. Act I; Sc. I.

For the same reasons, the peasantry of the United Provinces also begin the formation of their heaps of winnowed corn either exactly at 12 o'clock in the day, or shortly after 12 o'clock in the midnight.

The taboo against speaking is also observed in connection with the cultivation of cotton in Northern India. In the district of Bareilly, when the cotton seeds sown in the fields have sprouted and grown up into seedlings, the cultivator goes to the field on the forenoon of a Sunday [Note that it is a holy day and auspicious for the performance of agricultural ceremonies, as, for example, of the *Eekhraaj* ceremony (ईखराज or عیقرراج)³ for the planting of sugarcane in the western districts

of 1845), p. 117; p. 140. Also Crooke's *An Introduction to the Popular Religion and Folklore of Northern India* (Allahabad Edition of 1894), p. 386.

¹ J. Wilson's *Karnal Settlement Report*. Lahore: 1886. p. 174.

² Crooke's *An Introduction to the Popular Religion and Folklore of Northern India* (Allahabad Edition of 1894), p. 386.

³ Elliot's *Supplement to the Glossary of Indian Terms* (Agra Edition of 1845), p. 308.

of the U.P., and also for the performance of many magical rites for the cure of ailments and hydrophobia¹] with some butter, sweetmeats, and cakes. He lights a fire by way of sacrifice [Compare this with the instances, mentioned *supra*, of lighting the fire (in the Rohilkhand Division) on the threshing-floor, and the fire-offering made (in the Bareilly district) to the heap of winnowed grains] and makes an offering of some of the eatables and *eats the remainder in perfect silence.*²

This taboo is also strictly observed in connection with a curious festival which is celebrated in a good many of the Feudatory States of Central India. It is known as the *Maun Charaun* or the Festival of the Silent Pasturing of Cattle. Those who take part in its celebration get up at the peep of dawn, wash and bathe, besmear their bodies with oil, and be-garland themselves with wreaths of flowers about their necks. *While they are undergoing these operations, they observe profound silence and make their wants known by means of gestures. When everything is ready, they go to the grazing-ground in solemn procession in profound silence.* Every one of the celebrants holds a peacock's feather over his shoulder for the purpose of scaring away demons. [Compare this with the curious custom of frightening the cattle (prevalent in the district of Hoshangabad in the Jubbulpur Division, C.P.) in which strings of peacocks' feathers are tied to their horns³ presumably as spirit-scarers]. *They remain in silence with the cattle for an hour or two and then come back home.* Thereafter, a wrestling-match is held among the Ahirs or cowherds. When the dark shades of evening fall, a gun is fired, and the Maharaja breaks his fast as also his vow of silence.⁴

While on the subject of rural ceremonies connected with the securing of welfare of the cattle, I may mention that the taboo against speaking and the presence of strangers is also observed on the occasion of performing rites for the transference or expulsion of cattle-diseases. Whenever a murrain breaks out among the cattle in the Orāon country (in Chhota Nagpur), the Orāon bachelors select a day for performing the above-mentioned ceremony, an intimation of which date is given by the village-kōtwār to all the villagers. On the evening of that day, every family in the village places one or more old earthen vessels in front of its hut. After the evening meal has been partaken of, all the family-members, save and except the

¹ *Vide my article North Indian Folk-Medicine for Hydrophobia and Scorpion-sting in J. and Proc., A.S.B. (N.S.), Vol. XI., p. 219; as also Crooke's An Introduction to Popular Religion and Folklore of Northern India (Allahabad Edition of 1894), p. 330.*

² *Bareilly Settlement Report.* By S. M. Moens. Allahabad : 1874. p. 382.

³ *Settlement Report of Hoshangabad.* By Sir C. A. Elliott. Allahabad : 1867. p. 17.

⁴ *North Indian Notes and Queries, Vol. I., p. 154.*

bachelors, remain inside their respective huts and *observe the profoundest silence*. At about the middle of the night, when all the earth and air are hushed in perfect silence, the young Orāon bachelors gather together at the village-ākhrā and, attiring themselves in nature's vestments [Note that this is a nudity-spell meant to frighten away the spirit of the disease from the village], arm themselves with cudgels. At a given signal, the bachelors, in a state of perfect nudity, give chase to the village cowherd who is present there with a wooden cow-bell hanging either from his neck or waist. While pursuing the latter, they smash with their cudgels all the earthen vessels left in front of the huts of the village. *They also belabour with their cudgels whomsoever they may hear talking or making any sort of noise whatever.*¹ [With the rest of the ceremony we are not concerned, as it is outside the scope of this paper].

We have now finished our examination of the taboo against speaking as it is observed in connection with various agricultural ceremonies in Northern India. We should now try to find out if any parallel to the aforementioned vow of silence exists in European folklore. In our search for it we have been successful, for we find that there is, at least, one European practice in the performance whereof perfect silence is maintained, namely, in the making of what is known as the dumb-cake. Arabella Whimsey says in the *Connoisseur*, No. 56: "I and my two sisters tried the dumb-cake together: you must know two must make it, two bake it, two break it; and the third put it under each of their pillows (*but you must not speak a word all the time*), and then you will dream of the man you are to have—after that I took a clean shift, and turned it, and hung it upon the back of a chair; and very likely my sweetheart would have come and turned it right again; but I was frightened, and *could not help speaking, which broke the charm*. Many similar practices prevail to this day."²

Similarly, there are numerous instances, in European folklore, of the taboo against speaking being prescribed as a condition which the hero or heroine must fulfil before he or she can achieve a difficult task set to him or her. In a folktale from the island of Rügen, an old heathen king, who had amassed a colossal hoard of jewels and gold, was, for his avarice, changed into a great black dog for keeping watch and ward over his riches. He can be disenchanted from his canine shape only by a virgin of immaculate reputation if she can go, naked and alone, to his castle on St. John's Night between twelve and one o'clock, bring back as much of the hoarded wealth as she can by sunrise *without once looking behind her or speaking a*

¹ *The Orāons of Chhota Nagpur*. By S. C. Roy. Ranchi: 1915. pp. 253-255.

² *Supplement to the Glossary of Indian Terms*. By H. M. Elliot, Esqr., B.C.S. Agra: 1845. p. 20.

single word, the violation of which taboos would bring destruction on her. In another folktale from Pomerania, an enchanted princess can be disenchanted only if her deliverer would carry her to the churchyard of Wusseken and place her down there *in profound silence and without looking round in the meantime*. Similar incidents also occur in a *märchen* from Eastern Pomerania.¹

Now arises the question : Why is profound silence observed during the performance of the aforementioned agricultural operations ? The popular explanation appears to be that, if any talking is done or even if an ejaculation of any kind whatever is uttered, evil spirits would come and deprive the corn of its substance and nutritive properties. Is this explanation plausible ? I think not. I, therefore, venture to propound below a theory which seems to me to explain, with at least some show of plausibility, the reason why the taboo against speaking is observed while the aforementioned agricultural operations are in full swing. Now Mr. E. S. Hartland has collected a large mass of evidence from which he has shown that supernatural beings, without any distinction whatever, dislike not only being recognized and spoken to, but also being seen, or at any rate being watched, and are only willing to manifest themselves to human beings at their own sweet will and pleasure and for their own purposes.² Now the Earth-deity or the Earth-Mother is one of these supernatural beings.

I have already shown that when primitive man first attempted to produce food by cultivating the soil, he keenly observed all that helped or hindered him. While he and his women-folk recognised the sun-spirit and rain-spirit as beneficent agents striving to help them, the Earth, great and kindly, in whose very self the seed was embedded, stood forth conspicuously above all, as the one agent which helped them greatly. They, therefore, came to look upon the Earth as the sole agent who, with or without the aid of the sky- or heaven-spirit, supplied their wants. The next step was that they came to look upon the Earth in the light of a spirit or goddess. The Earth, therefore, in the capacity of the Giver of Sustenance, has come to be revered and worshipped among many primitive races of people all over the world, as is evidenced by the numerous rites and ceremonies performed by them for ensuring a bountiful yield of crops, fertility in woman herself and in cattle.³

While the operations of sowing the seeds, heaping up the harvested crops, threshing out and winnowing the same, and

¹ *The Science of Fairy Tales*. By E. S. Hartland, F.S.A., London : Walter Scott. 1891. pp. 236-7 ; 242.

² *Op. cit.*, p. 69.

³ *Vide my article The Worship of the Earth-Mother in The Hindustan Review for July 1916, p. 47.*

measuring the cleaned grains are going on, the Earth-Mother, who is believed to have helped the agriculturists in sowing and growing their crops, is supposed to be present at the scenes thereof. It is for her propitiation that the little nameless acts of worship, which have been set forth above in detail, are performed. Now there is evidence in European folklore to show that the Earth-goddess or the Earth-Mother dislikes being seen or spoken to. In the island of Rügen in the Baltic Sea, the goddess Hertha, who is identified by the Roman historian Tacitus with the Mother Earth or the goddess of the soil, to whose kindly offices the produce of the land would be attributed, in whose name and by whose permission would all agricultural operations be performed, had her dwelling in the Herthaburg. Often on moon-lit nights she comes out attended by her maids to bathe in the lake. Whoever looks upon her while she is performing her ablutions, is drawn down to the lake and engulfed in its depths.¹ It would thus appear that, while the agricultural operations go on, she is believed to be present at the scenes thereof and, therefore, to object to her being seen by any except the operators themselves. As she is a supernatural being, she does not like that anybody should speak to her or profane the scene of her hallowed presence by breaking the silence that reigns thereover. Consequently the agriculturists themselves, who take part in these operations, also observe profound silence.

¹ Hartland's *The Science of Fairy Tales* (Edition 1891), pp. 71, 89.

5. NUMISMATIC SUPPLEMENT No. XXVIII.

Note.—The numeration of the articles below is continued from p. 140 of the "Journal and Proceedings" for 1916.

170. THE DRACHME OF THE SASSANIAN QUEEN BŌRĀN.

In the Numismatic Supplement No. XVI, Art. 99, by Mr. Thanawalla is a description of the rare "dirham of Queen Purāndukht," belonging to my friend Mr. Maneck R. Settna.

The mint monogram on this drachme is given in the description as رām (rām), but on referring to the illustration I felt unable to accept this rendering, the correct version being undoubtedly نīḥch (nīḥch). The owner, in order to enable me to confirm my opinion, courteously gave me an opportunity of inspecting the coin, with the result that I have no hesitation in declaring the reading رām to be incorrect and misleading.

Mordtmann reads the monogram as "nāch" and would identify the mint with Nakhjevan, situated on the Araxes on the Russo-Persian frontier. This rendering is very doubtful. The چ is indisputable, but the intermediate letter, composed of two strokes rounded off and not resembling A, has the first part complete and distinct, while the second forms the head of H. In preferring nīḥch to nāch I am supported by De Morgan, who argues that the reading of Mordtmann can be accepted only if his interpretation of A be given the Pahlavi value of KH, a condition prohibited by the distinctness of the letter I. He suggests as the mint name Nīḥchavan, but unfortunately he has not indicated the situation of this town.

The suggested similarity of monogram with that in Dorn, Pl. XXIV, fig. 38, noted in the description, does not exist. On the contrary the monogram tallies exactly with that on fig. 35 of the same plate and also with fig. 19 on Pl. XXIX.

According to Mordtmann the mint "rām" occurs only till the end of the reign of Khusrau Parvīz (628 A.C.). The mint "nīḥch" is found frequently on the drachmes of the ephemeral sovereigns between Khusrau Parvīz and Yezdegerd Shahriyār. I have a coin of the second regnal year of Hormazd V bearing the monogram "nīḥch," exactly resembling that on the coin under review.

An important part of the obverse legend has been omitted altogether. This is the monogram above the word افزون (af-zūtū) behind the head of the Queen. This monogram Mordt-

mann gives as *زمان* (zamān)=for ever; but from the legend on the gold coin of Kobād described by Drouin we may infer that it is the shortened form of *جوبانی* (jaubānī). The whole obverse legend of the gold coin is, in Pahlavi characters, *جوبانی افزو* (jaubānī afzū), the meaning of this phrase according to Drouin being "the glory of the young prince." In my opinion the monogram in question is nothing but the word "afzū," its gradual development being indicated by an examination first of the legend on the obverse behind the head in Dorn, Pl. XXVI, fig. 1, secondly those on figs. 11, 12 and 14 of the same plate and fig. 20 on Pl. XXVII, and lastly Pl. XXVIII, fig. 5. It would appear therefore that the evolution of the monogram commenced in the latter part of the reign of Hormazd IV and was complete by the early years of the reign of Khusrau Parvīz. The surprising feature is its appearance side by side with the same word in its entire form. It seems as if this were due to ignorance on the part of the die-sinkers, who possibly regarded the conventional form of "afzū" as a necessary appendage to the monogram itself.

What is the true name of this Queen? The Persians called her *پوران دخت* = Purān-dukht, and thus she has been designated by later Oriental and European writers; but the suffix 'dukht' obviously indicates, for the sake of distinction, the sex of the princess, and it is clear from the contemporary Byzantine writers, who never designate her except by the name of Bōrān, that the Persian authors of the Muhammadan epoch changed the first letter into 'p.' The fictitious Persian form of Purān-dukht should be rejected, as well as Taurāndukht, a popular mediaeval rendering which was clearly due to displacement of the diacritical dots. The true spelling of the name is therefore Bōrān, this being the Arabic and Persian pronunciation of the correct Greek form *Βοράν*.

Queen Bōrān was the daughter of Khusrau Parvīz and sister of Kobād Shērōe and Queen Āzarmī-dukht. Their mother was the Princess Mary, daughter of the Emperor Maurice. After her suffering several reverses from the Arabs the inhabitants of Madain (Ctesiphon), then the western capital of the empire, revolted and Bōrān was deposed in October 631, the fact of her subsequent murder being recorded by Drouin.

As Bōrān, according to the majority of the historians, reigned for 16 or 17 months only, it is surprising to find coins of her third regnal year. The Sassanian sovereigns, however, reckoned the regnal years according to the calendar and not from the date of accession; so that a ruler ascending the throne in the last month of the Persian year would enter his second regnal year on the first day of the following month.

In this case Bōrān entered on her third year in the fourteenth month of her reign. According to the calculations of Noeldeke Queen Bōrān began to reign in the summer of 630 and was deposed in the autumn of 631. As the Persian year ran from June to June, we can safely place her accession in May or the beginning of June 630. Thus:—

May to 16th June 630, about one month of reign, 1st year.

17th June 630 to 16th June 631, 2nd year.

17th June to October 631, about four months of reign, 3rd year.

This makes in all about seventeen months of reign, with the two extreme dates of May 630 and October 631. Obviously therefore coins of the first regnal year, as that under consideration, must be extremely rare, as the issues of the first month were probably, but not necessarily, very limited.

FURDOONJEE D. J. PARUCK.

171. THE DIRHAM-I-SHAR'AI.

Among the exceedingly varied and often artistically executed issues of the Mughal Mints, the "legal drachms" of Aurangzeb possess no small interest, at least for the collector who can bring historical information to bear on Numismatic enquiry, and can, at the same time, illustrate the often imperfect annals of the Musalmān rulers by their coins. These curious *dirhams* are so very rare as to be absolutely unrepresented even in the Indian Museum, and altogether only one or two specimens are known of the issue of one or other of about five Mints (Allāhābād, Pātnā, Katak, Lāhor and Multān. Whitehead, P.M.C. xxvi). But if their scarcity is not a little provoking, the silence of the Muhammadan chroniclers, who are never weary of filling pages with banal descriptions of pageants and ceremonies, honours and titles and even presents and prodigies, about the date, the object, or the circumstances connected with the issue of this currency, is almost exasperating. There is not a word about them in the valuable Introduction to the Indian Museum Catalogue, and all that Mr. Whitehead says of them is that "*apparently, they had some bearing on dowry and the Muhammadan Law.*" (P.M.C. Introduction, xxv-xxvi). In another place, he appends the following note:—

"According to the Muhammadan Law, a property-owner must possess assets of the value of 200 dirhams before he becomes liable to the tax of ۞ (alms). Taking the value of the *dirham* to be that fixed by the Khalifah 'Umr (Omar), ten of these *dirhams* are equivalent to seven *Misqāls*. Such a dirham is called a legal *dirham*, and it seems that Aurangzeb had speci-

men coins made of the original value so that his subjects might know what a *dirham* actually was, and might be assessed to alms strictly on the basis of the ancient law-books.

'The amount of property subject to the tax of *Zakāt* (alms) is called a *nisāb*. A *nisāb* may consist of flocks, chattels, money, etc. A *nisāb* of silver is equivalent to 200 *dirhams*. Every ten of these *dirhams* must weigh seven *misqāts*, i.e., 1 *dirham* = $7/10$ *misqāl* (مِثْقَال). Such a *dirham* is called a legal *dirham* (درهم شرعی) * * *. According to the above data, the weight of a legal *dirham* is 44.6 grains." (*Ib.*, p. 437).

Now this is the question that lies before us—Is it possible to substantiate either of these conjectures? In other words, is it in our power to quote from any of the contemporaneous histories of Aurangzeb any reference, direct or indirect, connecting these *dirhams* with the payment of dowries, the assessment of *zakāt*, or the levying of any other tax or due which it was the duty of the Faithful to pay and the privilege of their rulers to demand, according to the accredited exponents of the Muhammadan Law? I am not aware that any such testimony has been actually cited, and I may be therefore permitted to quote the little that I have been able to glean on the subject. Let me first take the question as it relates to dowries, and mention the only instance within my knowledge, in which the dowry of a daughter-in-law of Aurangzeb was fixed, by the express orders of the Emperor, at five hundred of these new-fangled *dirhams*. The passage occurs in the *Maāsir-i-Ālāmgarī*, a contemporary chronicle which was written in 1122 A.H. (1710 A.C.) by Muhammad Sāqī Musta'id Khan, Munshi or Secretary to 'Ināyat-ullāh Khan, the Wazir of Bahādur Shāh, Shāh 'Ālam I. In his account of the events of the year 1092 A.H. this writer says:

سیزدهم رجب سیدی یحیی شهر بانو دختر عادلشاه بیجا پوری را
آوردہ بحرم سرای حرمت رسانید و او را بستم رجب با پادشاهزادہ محمد اعظم
شرق ہمبستری دست داد - سہرہ بستہ بودند - در مسجد خاص و عام قاضی
شیخ عبد السلام نکاح خواند و بہ تبیعت منیہ حضرت خیر البشر علیہ الصلوۃ
والسلام پانصد درهم مہر مقرر شد *

(Bibliotheca Indica Text, p. 210, ll. 16-20).

"On the thirteenth of Rajab [1092 A.H.] Sidi Yahyā escorted Shahr-bānū, the daughter of 'Ādilshāh of Bijāpūr, and she entered the Harem of Honour. On the twentieth of Rajab she had the felicity of having her marriage with the

Prince Muhammad A'azam consummated. The Emperor himself had bound the chaplet on [to the forehead of the Prince]. The Qāzi 'Abd-u-s Salām read the marriage service in the Mosque.

The dowry was fixed at five hundred dirhams, in accordance with the practice of His Holiness, the Best of Mankind [i.e., the Prophet Muhammad], on whom be Blessings and Peace."

It would appear that in his zeal to re-establish in India the legalistic system of the Early Caliphate, and restore the "simple life" characteristic of the primitive days of Islam, Aurangzeb made an endeavour to abolish the demand and payment of extravagant sums as dower, which had become customary in his day. "Beware, make not large settlements," the Prophet had said, "upon women; because if great settlements were a cause of greatness in the world, and of righteousness before God, surely, it would be most proper for the Prophet of God to make them." (*Mishkāt-al-Maṣābiḥ*, Book XIII). "According to Muhammadan Law, the wife is not entitled to a dower of more than ten *dirhams* in those cases in which a larger sum has not been previously fixed upon." (Hughes, Dictionary of Islam, pp. 91, 314). "The early Hanafi Lawyers," says Mr. Ameer 'Ali, "fixed ten *dirhams* (equal to about five or six francs), as the minimum for dower. The Mālikis inhabiting a poorer and less populous country than that in which the early Hanafi lawyers flourished, consider three *dirhams* (one franc and eighty centimes) as the lowest sum which can be given by way of *Sadāk* or *Mahr* * * * These minima have been abandoned for a long time, and it has become customary in different countries to fix the amount of dower entirely by a consideration of the circumstances of the husband and wife. In India, for example, among that portion of the Musalmān community which occupies an analogous position to the upper middle class of English society, the amount of dower ranges from Rs. 4,000 to 40,000. In Behār, the latter is, generally speaking, the customary dower; in lower Bengal, there is no custom. Among the lower classes, the *Mahr* varies from Rs. 50 to 400. In princely families the dower consists of several lacs of Rupees." (*Muhammadan Law*, II, 383).

In another place, the same authority tell us: "The Prophet did not enunciate any fixed rule as to the amount of dower. He expressly left it to custom and local usages, but as he appears to have settled five hundred *dirhams* upon Maimuna, the Shiāhs consider that amount to be the *Mahr-i-Sunnat*. The *Radd-ul-Muhtār* says the dower of "our Lady" Fātimā was 400 *dirhams*." (*Ibid.*, II, 382 note). It is clear that in fixing the dower of the Bijāpur princess at five hundred *dirhams*, Aurangzeb took as his model the practice of the Prophet in the case of Maimunā. But not content with cutting down the amount, he appears to have dreamt of introducing along with it a currency, of which

the denomination, the weight and the legend were all borrowed from the practice, and associated with the sacred memory of those Apostolic rulers, 'Umar the Discriminator, and 'Usmān the Lord of the Two Lights. The opposition he met with from his own children, and probably also the *vis inertiae* of a conservative and obscurantist priesthood, appear to have speedily convinced him of the futility of his efforts. In our own days, the Amir 'Abdū-r-Rahmān of Afghānistān, finding that "some important and influential families used to get their sons-in-law to sign such large amounts of dowry for their wives against their wish that it was impossible for them to pay," fixed the maximum amount even for princes of the royal family at Rs. 3,000 and the minimum at Rs. 300. (Life, Eng. Trans. II, 67.)

Indeed, this case of the Bijāpūr Princess is the only one that I have been able to find, and I feel that I should be conveying an absolutely misleading idea of its real significance, if I did not add the following facts of collateral interest. These are that there are no less than thirty-six other notices of the marriages of Royal Princes or great nobles within the covers of the *Maāsiri-i-'Ālamgiri* itself, that in eight of these cases, the various amounts of the dowry stipulated are expressly mentioned in Rupees only (fifty-thousand to six lacs), that the above instance was the only one in which it was fixed in *dirhams*, and that a marriage is recorded only four days afterwards, in which the *Kābin* or *Mahr* was fifty-thousand Rupees. [For these notices, see the Bibliotheca Indica Text, pp. 29, 37, 73 (Rs. 1,80,000), 74, 78 (six lacs of Rupees), 110, 112, 114, 119 (five lacs of Rupees), 120, 124 (two lacs of Rupees), 125 (four lacs of Rupees), 148, 152, 155, 158, 166 (two lacs of Rupees), 167, 211 (fifty thousand Rupees), 221, 225, 247, 248, 250, 274, 284 (two lacs of Rupees), 312, 347, 372, 374, 473, 479, 480, 482, 496.]

Let us now see if these *dirhams* are referred to in connection with any other tax or due sanctioned by Musālmān jurists. Our thoughts at once turn to the *Jizya* or Poll-tax, the payment of which was obligatory on all *Zimmis*, and which Aurangzeb re-imposed on the Hindus and others of his non-Moslem subjects, after the lapse of more than a century. I will now proceed, accordingly, to quote an illuminative passage which occurs in regard thereto in the *Mirāt-i-Ahmadi* of 'Alī Muhammad Khān. The author was Diwān of Gujarāt in the reign of Muhammad Shāh, and he has written a history of the Province under Mughal rule, which is truly remarkable for the wealth of statistical detail that is buried in its pages. Among other things, he informs us that no less than five lacs of Rupees were annually realized by the *Jizyā* in this single province, and he quotes extracts from the Imperial Farmān by which it was re-imposed.

After defining the *Ahl-i-Zimma*, as the People of the Book

(Jews and Christians), Magians (Zoroastrians) and Idolators, and exempting from payment women, the young, the blind, the lame, the insane, and the destitute poor, the Farmān goes on to say:

دویم -

در هر سال دوازده درهم از فقیر و بیست و چهار درهم از متوسط و چهل و هشت درهم از غنی باید گرفت چون بالفعل دراهم رائج نیست نقره بوزن سه توله و یک ماشه و سه ربع ماشه و بیستم حصه ماشه از فقیر و ضعف آن از متوسط و ضعف آن از غنی در هر سال بگیرند و تکلیف نکنند و اگر کسی روپیه بدهد همین مقدار وزن نموده بگیرند بعد از آن که دراهم جاری شود دراهم بگیرند *

سبوم -

در تفسیر غنی و متوسط و فقیر اختلاف است باید که موافق این تفسیر عمل نمایند غنی آنست که در ملک او ده هزار درهم یا زیاده از آن باشد و متوسط آنست که در ملک او زیاده دویست درهم باشد و فقیر آنست که در ملک او از دویست درهم کم باشد *

Mirāt-i-Ahmadi, Bombay Lithograph, 1307 A.H., Part I, 313 (collated with a manuscript).

"Secondly.—Every year, twelve dirhams should be taken from the *Faqir*, twenty-four dirhams from the *Mutawassat* and forty-eight from the *Ghani*. But as dirhams are, as a matter of fact, not current, three tolāhs and one māshā and three-fourths and one-twentieth of a māshā of silver may be taken from the *Faqir*, and twice as much from the *Mutawassat* and the double of the latter from the *Ghani*. They should not insist [on receiving payment in any particular medium]. If any one gives Rupees, they should be taken [accepted], if they contain the same weight of silver. And dirhams should be taken [accepted] after dirhams are in circulation.

Thirdly.—As there is a difference of opinion as to the interpretation of [the words] *Ghani*, *Mutawassat* and *Faqir*, they should act according to the following interpretation. He is the *Ghani* [lit. Rich] who has property worth ten-thousand dirhams or more. The *Mutawassat* [lit. Middling] is he whose goods are worth more than two hundred dirhams, and the *Faqir* [lit. poor] is he whose possessions are less than two hundred dirhams."

Detailed instructions are then given to the effect that the *Jizyā* should be brought by the payer in person and not sent by a messenger, that the payer should stand while the collec-

tor remained sitting, that the collector should place his hand over that of the payer, and take the money out of it. The *Ghani* (Rich) were at liberty to pay the whole amount at once, the *Mutawassat* (Middling) might pay it in two instalments, and the *Faqir* (Poor) in four. It is also provided that the tax should be remitted on conversion to Islām and it was to cease also in case of death.

These statements are so explicit, and the explanation they furnish of the origin of these coins is so satisfactory, that it is scarcely necessary to say much by way of comment. It is clear that these dirhams were not current when this *Farmān* was issued about Safar 1090 A.H., as the *Maāsir-i-Ālamgiri* expressly tells us. (Bibl. Indica Text, p. 174. Elliot and Dowson VII, p. 296 note). It is also plain that they were first coined *some time afterwards*, in fulfilment of the promise made in the *Farmān*, and with the object of making it easy for the *Zimmis* to pay, and the officers to receive, the tax as it had been paid and levied in the days of the Khalifs of old. We know that "the Caliph Omar, during his time, taxed those who were not of his faith, at the rate of 48 dirhams for persons of condition, 24 for those of the middle class, and 12 for the lowest class. This was called the *Jaziyah* (capitation-tax)." *Āin-i-Ākbari*, trans. Jarrett, Vol. II, p. 57. See also the *Hedāyāt*, Book IX, Cap. II and VIII.

After having seen how closely Aurangzeb followed the example of 'Umar in this and other instances, let me now say a few words about the equivalent weight in silver of twelve dirhams. This is expressly stated to be 3 tolās, 1 māshā and three-fourths and one-twentieth of a māshā. With the tolā of 180 and the māshā of 15 grs. this would amount to $540 + 15 + 11\frac{1}{4} + \frac{3}{4} = 567$ grs. Divided by 12, this would fix the gross weight of the dirham at 47.25 grs.—a result which approximates very closely the actual weight of the specimens in our Museums (Whitehead, P.M.C. Nos. 1950 and 2271) and private cabinets, and also the theoretical limit arrived at by the most recent continental authorities on Early Musalmān Metrology. "The most probable weight," says Zambaur, "is 2.97 grammes, which best agrees with the extant coins and glass-weights, as well as with the coin-weights of the time of Al-Muqtadir (A.H. 295-320 = 908-932 A.O.), discovered by E. T. Rogers in the Faiyum. (E. V. Zambaur, in Houtsma's *Encyclopaedia of Islam*, article *Dirham*). Decourdemanche has arrived at the figure 2.83 grammes by a series of ingenious calculations. (J. A. Decourdemanche, *Etude Metrologique et Numismatique sur les Misqals et Dirhams Arabes*, 1908).

2.97 grammes = 45.8 grains; 2.83 grammes = 43.8 grains.

The next question is, had these dirhams any connection with the assessment of *Zakāt* also? In other words, were they issued by Aurangzeb with the object that his "subjects might

be assessed to alms strictly on the basis of the ancient Law Books?" It is impossible to answer the question in the affirmative. It is almost equally difficult to give a definite reply in the negative. All that can be said, in the present state of knowledge, is that no direct evidence has yet come to hand of the connection, and that the indirect evidence that is available is rather against than in favour of the supposed connection. This *indirect* evidence I may be now permitted to summarise. Of the three contemporary chronicles of Aurangzeb which have been published, the *Ālamgir-nāmah*, the *Maāsir-i-Ālamgiri* and the *Muntakhabū-l-Lubāb*, the first tells us nothing whatever about the matter. The author of the *Maāsir* has a solitary reference to the *zakāt* in the long and perfunctory *éloge* at the end of the volume, and states that before his accession, Aurangzeb used scrupulously to pay the *zakāt* that was due on his food and clothing, that after coming to the throne, he devoted to that purpose the proceeds of several villages and two or three salt-producing tracts which were appropriated to the privy purse, and that he gave the entire income from these sources to the *Ārbāb-i-Istahqāq*—deserving persons. (Bib. Ind. Text, p. 525). The little that may be gleaned from Khāfi Khān's *Muntakhabū-l-Lubāb* is slightly more to the purpose, and may be read in Dowson's translation, which, as usual, expresses the general sense of the passage correctly enough, but is deficient in critical exactness. Khāfi Khān tells us that "an order was promulgated exempting the commercial goods of Musalmāns, from tax throughout the dominion of Hindustan. * * * The Revenue Officers then reported that Musalmāns * * * passed the goods of Hindus in their names, and thus the payment of the *zakāt* prescribed by the law was avoided. So an order was given that, according to the Law, two and a half per cent should be taken from Musalmāns and five per cent from Hindus." (Elliot and Dowson, History of India, VII, 293).

The last sentence is of some importance and it is necessary to quote the historian's actual words:

حکم فرمودند کہ بدستور سابق و موافق شریعت غنائی صد دو و نیم

روپیہ از مسلمانان و پنج روپیہ از ہنود گرفته باشند *

(Bib. Ind. Text, II. 230.)

"He commanded that in conformity with ancient usage and the Illustrious Law, *Rupees two and a half* should be exacted for every hundred from Musalmāns and *Rupees five* from Hindus."

It is not unworthy of note that there is an express reference here to *Rupees*, and nothing whatever is said about assess-

ing either the Faithful or the Infidel to "alms" in *dirhams*, though the order referred to by Khāfi Khān was issued some time after their actual coinage.

I now come to the *Mirāt-i-Ahmadi*, of which the writer again quotes the *ipsissima verba* of five Imperial Farmāns on the subject of *zakāt*. The first of these is dated 4th Shawwāl 1075 A.H. and was issued with the object of doing away, once for all, with the unequal rates at which the *zakāt* was levied in different parts of the Imperial dominions, and establishing a uniform rate of "one in forty" (2½ per cent) for Musalmāns and "two in forty" (5 per cent) for Hindus. (*Mirāt-i-Ahmadi*, Bombay Lithograph 1307 A.H., Part I, pp. 272-73). By the second, bearing date 25 Zilq'ad 1077 A.H., Musalmān merchants were exempted from payment of the tax, which continued to be levied from the goods of the Hindu traders. (*Ibid.*, pp. 280-81). The third re-imposed it on the former on the 5th of Rabi-ul-Awwal of the 25th Regnal year (1093 A.H.) on account of their collusion with Hindus for the purpose of defrauding the Exchequer (*Ibid.*, pp. 315-16). The fourth was issued in 1099 A.H. and enjoined that the tax should be levied not, as heretofore, in the place where the goods had been *purchased*, but in that where they were actually *sold*. (*Ibid.*, pp. 335-6). Ten years afterwards (1109 A.H.) the rule was again altered and it was determined, for fiscal reasons, to revert to the old practice of realizing the *zakāt* in the place of purchase. (*Ibid.*, pp. 357-58).

Now there is no reference whatever to these Dirāhīm-i-Shar'āi in any one of these five documents, although the last three were all issued *after* the coinage of the dirhams had commenced about the 24th Regnal year (1092) to which the specimen in the Punjab Museum belongs. (Whitehead, P.M.C. No. 1950). It must be remembered also that the *zakāt* was an *ad valorem* duty, and as the value of the goods of merchants were entered in their Bills of Lading and Invoices only in Rupees, the Revenue Officers must have found it very inconvenient to levy the duty in any other medium than the current coin of the Realm. Indeed, in determining the value of the *nisāb* or minimum exempted from the payment of *zakāt* by the Law of the Prophet, Aurangzeb himself found it necessary to express its equivalent in two of these Farmāns (the first and the third), only in Rupees (Rs. 52-8 and Rs. 54-12-6). (*Mirāt*, pp. 278 and 316.) It is possible to deny any significance to this fact, but it may also be maintained with reason, that if the Emperor had seriously intended to make the *zakāt* payable, optionally or otherwise, in the new-fangled dirhams, he would have employed the phrase 200 *dirhams*, or at least the alternative expression '200 *dirhams* or Rs. 52-8' (or Rs. 54-12-6).

I am aware that this is at best a negative argument, and

that the silence of these documents on the subject is far from conclusive. I have however thought it my duty to state the other side of the case, so far as my knowledge will permit.

Briefly, we may say with some confidence that these legal dirhams had their origin in, and were the direct result of, Aurangzeb's re-imposition of the *Jizyā*. Of this, we have a confirmation in the fact that the only Emperor in whose times the issue of these pieces appears to have been revived, was Farrukhsiyar. A solitary specimen of this re-issue in the Punjāb Museum is of the 6th Regnal year (Whitehead, P.M.C. No. 2271). We have the testimony of Khāfi Khān to the effect that in that very year an order was passed for levying the *Jizyā* strictly from the Hindus, that this was done at the instance of 'Ināyat-u-llāh Khān, who had been Aurangzeb's own Munshi and now became Financial Minister, and that it gave great offence to Ratan Chand, the Hindu Diwān and factotum of the all-powerful Savyad 'Abdullāh (E. D. VII, pp. 462 and 447. *Muntakhabū-l-Lubāb*, II, 775. See also the *Siyar-a-Mutākhharin*. Eng. trans., Calcutta Reprint 1902, I, p. 105).

Secondly, they appear to have been also connected with Aurangzeb's projected reform in regard to the reduction of the extravagant amounts which had then come to be demanded as *mahr*.

But it is impossible to say in the present state of knowledge, that they were issued with the object that the subjects "may be assessed to alms or *zakāt* on the basis of the Mint Law Books." This part of the question must, for present, remain undecided, and we must wait for further evidence on that head.

S. H. HODIVĀLĀ.

P.S.—I have followed the manuscript referred to in taking the weight of silver equivalent to 12 Dirhams as 3 Tolās, and $1 + (\frac{3}{4} + \frac{1}{20})$ Māshā, and supposed it to stand for 567 grs. at 180 grs. to the Tolā. If the weight of the Mughal Tolā was, as some competent writers believe, 186 grs. Troy, this would amount to $585\frac{9}{10}$ grs. in the aggregate, and give an average weight of $48\frac{3}{10}$ grs. for the single Dirham. In the Bombay Lithograph of the *Mirāt-i-Ahmadi*, the weight of silver is thus stated: سه تولك و يك ماشه و سه سرخ و ربع ماشه باشد و بيستم حصه ماشه. It is clear that باشد here is scarcely in its proper place, and the interpolation of سه سرخ in the middle is also open to some suspicion; but supposing that the meaning is 3 Tolās, 1 Māshā, 3 Surkhs (i.e. *Ratis*) and $(\frac{1}{4} + \frac{1}{20})$ of a Māshā, the weight of silver would, at 180 grs. to the Tolā, be $564\frac{3}{4}$ grs. ($540 + 15 + 5\frac{1}{4} + 3\frac{3}{4} + \frac{3}{4}$), and we should have an average of $47\frac{1}{16}$ grs. only for the Dirham. If the Tolā is supposed to be equivalent to 186 grs. this would result in an aggregate weight of $583\frac{3}{4}$ grs.

($558 + 15\frac{1}{2} + 5\frac{1}{4} + 3\frac{3}{8} + \frac{3}{4}$) for 12 Dirhams, and the average of $48\frac{3}{4}$ grs. for the Dirham. The difference is not of any great consequence, and it is clear at any rate that the Dirham was valued at a little more than four annas. According to the contemporary writer quoted in Jonathan Scott's History of the Dekkan (II. 149), a rich Hindu, possessing two thousand rupees worth of property, was bound to pay *Thirteen Rupees*. This corresponds, obviously, to the 48 Dirhams which the *Ghani* or wealthy man, possessing ten thousand Dirhams, was obliged to contribute, and the Dirhams must therefore have been equal to $16 \times 13 = 208 \div 43$ annas, i.e. 4 annas and a quarter.

S. H. H.

172. "A NEW TYPE OF SILVER DIRHAM OF THE SASSANIAN MONARCH ZĀMĀSP (JĀMĀSP)."¹

My attention was drawn recently to the article thus entitled by Mr. Thanawalla, thanks to the kindness of my learned friend Dr. J. J. Modi in putting at my disposal the back numbers of the Numismatic Supplement. Careful consideration of the description and the illustration of the coin leads me definitely to the conclusion that the drachme in question is not attributable to Zāmāsp but was issued by *Khusrau I.* I would hesitate to come forward were it not for the following forcible reasons.

In the first place we have to consider the form of the crowns depicted on the coins of these two sovereigns, following the advice of Thomas who declares that "in most cases, even where the legends are hopelessly obscure or obliterated, we can place our specimens with the utmost certainty by the test of the form of the crown" (Sassanians in Persia, p. 26). Now all the coins of Zāmāsp hitherto published have the crescent and star above the middle of the crown, whereas the coin under discussion bears these symbols above the front edge, over the forehead, an arrangement followed invariably in the coins of *Khusrau I.* This important difference is illustrated clearly by the two coins depicted on Plate XXVIII which accompanied the same number of the Supplement.

Secondly, the coins of Zāmāsp always bear the representation of a boy, a statement supported by the remark of Drouin that "on all the coins the king is represented with an infant who tends him a crown." [Revue Archéologique, 1898; *vide* also Dorn, Pl. XVIII.]

The device of the crescent over the shoulders of the monarch may be considered another peculiarity of the coins of *Khusrau I.* (*vide* Dorn, Pl. XXII, XXIII, XXIV and XXV).

¹ J.A.S.B., Vol. VIII, No. 11. Numismatic Supplement No. XX, p. 536.

On the other hand I am unaware of any coin of Zāmāsp bearing a crescent in the field of the obverse. Similarly the star behind the head is a constantly recurring device on the coins of Khusrau I, but is never, I believe, found on those of Zāmāsp.

Of still more importance is the actual legend. On the coins of Zāmāsp the name is given usually in the abbreviated form of Zām, as admitted by Mr. Thanawalla, and occurs but rarely in full. Mordtmann (Z.D.M.G., 1865, p. 440) describes a drachme of this king on the obverse of which he believes the full name to be legible; and in Dorn (Pl. XVIII, fig. 8) we find a solitary specimen with Zāmāsp in its entirety, having Zām on the right and Asp on the left of the crown. No coin yet discovered, however, bears merely the second half of the name, and in the case under discussion I would submit that not only is the reading $\text{𐭥𐭥𐭥} = (a)sp$ untenable but that my rendering of 𐭥𐭥 instead

of 𐭥𐭥 = Khus(rui) is both natural and convincing. The first portion of the inscription is composed of the latter half of "a" and "u" and the second letter is unquestionably "s." The first stroke of the "a" is not apparent, but the "u" is very distinct (cf. Dorn, Pl. XXII, fig. 6; also Pl. XXII, fig. 14, Pl. XXV, fig. 56, and Pl. XXVI, figs. 10 and 14).

I refer to the coin illustrated by Dorn (Pl. XXII, fig. 6) more particularly as it was struck at the same mint (Merv) as that under discussion, and consequently we may expect to find in both the same local characteristics in script; peculiarities in writing being almost as common as local distinctions in dialect. The coin given by Dorn is of the fourth regnal year, while that under review is of the third, and the two present a marked similarity in almost every respect. This similarity is most striking in the case of the first two letters of the obverse legend. I have in my own cabinet a coin of the fifth regnal year of Khusrau I from the same mint, and this again displays almost identical characteristics, save it bears on the obverse behind the head the additional word *afzu*; the legend Khus (rui) bearing a distinct resemblance to that on the coin under examination. In the list of mints given by Mordtmann (Z.D.M.G., XXXIV, 1880, p. 109) the mint city of Merv is not mentioned as issuing coins of the third year of Zāmāsp, and this year is similarly omitted in the history of the Merv mint by De Morgan (Revue Numismatique, 1913, p. 349).

The crescents on the margin constitute a further point of material importance in the design. These are never found on the coins of Zāmāsp, and Drouin (Rev. Arch., 1898) states definitely that their introduction dates from the thirteenth year of Kobād I (501 A.C.), whereas Zāmāsp reigned from 497 to 499 A.C. It must be remembered that the reign of Kobād is divided into two parts; the first from 488 to 497 (regnal years 1 to 9), and the second, after Zāmāsp, from 499 to 531 (years 11 to 43).

The reverse of the coin, however, with its striking resemblance to that figured by Dorn, affords to my mind the most convincing proof that the drachme belongs to the early years of Khusrau I. In connection with the local divergence in script and speech noted above it is most significant that the coin illustrated by Dorn bears on the reverse the Pahlavi word "chehār" instead of the Semitic "arbā," this being the only instance known to me in which the Pahlavi word is used in place of the Semitic in the case of the first ten units. On my coin of the fifth and on that of the third year described by Mr. Thanawalla the fire-altar and the attendants are exactly similar. There are no crescents on the margin of the reverse, and none has ever been found on the reverse of any coin of Khusrau I.

The conclusion seems irresistible. For the reasons given the coin must be regarded as one of Khusrau I., since in view of the many other considerations it appears impossible to attribute it to any other monarch on the one disputable ground of the reading of an indistinct letter.

Strength is lent to this conclusion by Dorn who in his preface to the plates of Bartholomaei (p. 7) states that "these coins are arranged chronologically, on the grounds of their artistic execution, the manner in which the hair is dressed, the forms of the fire-altar, the astral signs, the granular ornaments round the coins and other indications which are necessary for the deciphering of the inscriptions." On the following page he remarks that with these plates at hand "one can easily attribute each Sassanian coin, with very few exceptions, to the monarch by whom it was struck and even thereby fix the year from the time of King Jāmāsp."

FURDOONJEE D. J. PARUCK.

173. "THE ZOROASTRIAN DEITY 'ARDOSHR' OR 'ARDVISHUR' ON INDO-SCYTHIAN COINS."

With reference to the paper No. 149 on "The Zoroastrian Deity 'Ardoshr' or 'Ardvishur' on Indo-Scythian Coins" by Mr. Framjee Jamasjee Thanawalla, published in the Numismatic Supplement No. XXV, in the course of which he remarks that an idea has recently struck him that the legend ΑΡΔΟΧΒΟ can be read as ardoshr = ardvishur = the female deity, goddess of sea, Avan Ardshur, I may be allowed to point out that no grounds are given for this suggestion and that the transition from the original ardukhsh into ardoshr and then into ardvishur is far from clear. He represents Avan Ardshur as the goddess of the sea, but this term is a corruption and finds no place in the Avesta language. The correct term is Ardvīçura Anâhita. We find in the Avesta "I shall offer unto the holy Ardvīçura Anâhita, goddess of the heavenly streams, pure

and undefiled, a goodly sacrifice accompanied by an oblation." —Yasht V, 9.

Ardviçura Anâhita, the Anâitis of the Greeks (compared by some with the Greek Artemis and by others with the Greek Aphrodite), the Mylitta of the Babylonians, the Astarte or Asteroth of the Syrians and the Venus of the Romans, was the female deity that presided over waters. As water led to the fertility of the soil, and as women led to the fructification and increase of the human race, this deity Anâhita, like her prototypes among other nations, was connected closely with the beauty of women and with their fructifying powers. Anâhita is mentioned further in the Avesta as purifying the wombs of women and easing the pains of childbirth.

Kangavar is a small town of great antiquity, lying directly on the route between Bisitun and Hamadan in Persia and contains important ruins of a temple of the Ancient Persian Diana. Jackson (*Persia Past and Present*, p. 240), after examining these ruins, believes "that they are the remains of a temple of Anâhita, the great Persian goddess of the heavenly streams, whom the Greeks identified with Artemis or Diana and whose worship was widespread throughout Iran in the time of Artaxerxes Mnemon in the fourth century before Christ."

Curzon (*Persia*, vol. II, p. 133) states that "Anahita, Anahidh, or Tanata, the Anaitis of the Greeks, the ruins of a temple to whom at Kangavar I have already noticed in vol. I, p. 51, was a goddess who from the end of the fifth century B.C. played a part in the official religion of Persia somewhat similar to the Phœnician Astarte, the Babylonian Mylitta, the Arabian Alitta, and the Hellenic Aphrodite. According to Plutarch, statues to her were put up in all the great cities of the empire. She is supposed to have been of Armenian or Cappadocian origin. The popular translation of her name into Artemis, or Diana, appears to me to be incorrect."

The term *Avan Ardshur*, as given by Mr. Thanawalla, if taken in its correct form *Avân Ardviçura* would mean "the waters of the Oxus." *Avân* (plural form of *av* = water) means waters, and the river *Ardviçura* of the Avesta has been identified with the Oxus. *Anâhita* means "immaculate."

Drouin reads the legend $\text{AP}\Delta\text{OX}\rho\text{O}$ as *Ardokhsho* (see *Le Nimbe sur les Monnaies des Rois Indo-Scythes*, *Revue Numismatique*, 1901, p. 196).

Dr. E. W. West (*Grundriss der Iranischen Philologie*, II Band. III Lieferung, *Pahlavi Literature*, pp. 75 and 76) reads and explains this legend as follows:—

$\text{A}\rho\delta\alpha\chi\text{š}\text{o}$ = *Ardvaxšo* (Avesta, *Ašivanguhi*). That is, *Ashivanguhi*.

He proceeds to say: "Allowing for the deficiencies of the Greek alphabet, which occasioned the use of the vowel o for the sounds of h and v (English w), in addition to its own, these

Greek transcripts ought to represent something like the Iranian pronunciation of the first century after Christ. And it is remarkable that this pronunciation often approaches much nearer to the modern Persian than to the sound indicated by the written Pahlavi, which latter seems to preserve traces of an older pronunciation more like that of ancient Persian and the Avesta; this is especially seen in the names Mibro, Šahrēvaro, and Vādo, when compared with the Phlv, Mitrō, Šatraver, and Vātō. The final vowel o, which is very rarely replaced by i or e on these coins, is used after every consonant that occurs; but in MS. Pahlavi it occurs only after b, p, t, č, k, n and g."

Sir M. Aurel Stein has come, correctly in my opinion, to the conclusion that this legend represents the Zoroastrian deity Ashishvang or Ardishvang, but he hesitates in the absence of more conclusive evidence, as he cannot reconcile her common name with the form of the legend. He also hesitates about the legend ΑΡΑΕΙΧΡΟ which he would identify, again correctly as I believe, with Ardibahist, provided that any satisfactory evidence could be found for the phonetic change of *sh* into *khsh*.

One very strong evidence in favour of the above identification of Ashishvang is the representation of the goddess on coins with cornucopie in her hands, thus resembling the Greek Tyche, the personification of Wealth and Fortune. The Hindu goddess Lakshmi is an exact prototype of Ashishvang.

Mr. Thanawalla takes the final o in the legend as an *izā-fat*: but this simple explanation does not help us, as an *izā-fat* necessarily implies possession of something, and there is nothing possessive in the phrase.

In Pahlavi an optional o is often found following the letters b, p, f, t, *ch*, j, k, and n either in the body or at the end of words. Even the oldest MSS. fail to observe any uniformity as regards this redundant o, but insert or omit it indiscriminately. This seems to show that o though inserted long ago was not pronounced. European savants give this redundant letter the sound ō. Formerly it was explained as being a remnant of the Avesta case terminations. This ending in ō may be a dialectic peculiarity of the Indo-Scythian race. Examples are not wanting of Grecised Persian names, e.g. Tiridates, Oromazis, Pharnabazos, Tiribazos, etc.

Should this letter be pronounced? Perhaps not, as we have similar examples of mute letters in other living languages. For example, in English we find words like know, fruit, condemn, column, calm, psalm, etc., where a letter or letters are quiescent; in French the consonants at the end of words are generally mute; and the Persian language, which owes its origin to Pahlavi, has h mute in many words.

Both Drs. Haug and West have agreed that this optional

final letter was a vowel, either u or o, equivalent to the final i added to many words in Sassanian Pahlavi, and that it probably represented some indistinct short vowel sound, resembling that which is inherent in all the consonants of Indian languages. Dr. Haug suggested that a short ö, distinguished by the prosodial symbol of brevity, might be suitable, to which Dr. West assented, adding that a simple short o is sufficient, since its position, at the end of a word, explains the nature of the sound. Where, however, it may represent an ô or aô in an original language, it should be written ô (see *Ardâ-Viraf*, Introduction, pp. xxxviii – xli, by Dr. Martin Haug, 1871).

Dr. West (*Cama Memorial Volume*, p. 108) says: "If Haug had lived till 1887, he would have been delighted to read a confirmation of his suggestion in Dr. M. A. Stein's Zoroastrian Deities on Indo-Scythian coins. These coins supply a dozen names of Zoroastrian Yazats in Greek uncials, each name ending with the shorter Greek O, which letter is also used to express the Avesta v, h and th. But the forms of the names are Pahlavi, such as one would hardly expect to be as old as the first century A.D., the period usually assigned to the Indo-Scythic kings whose names these coins also bear."¹

I must note that AΘPO with the variant AΘOPO is found on the gold coins of Huvishka, and not AΘPO or AΘOPO as given by Mr. Thanawalla. The reading athsho has no meaning known to me, but AΘPO is directly derived from the Zend âthr and is identical with the Pahlavi âtrō and the Persian adhar, "fire." The latter form has survived side by side with the more common âtach (a descendant of the ancient nominative âtars), chiefly as the name of the 9th Zoroastrian month and also the 9th day of every month. (See Sir M. A. Stein's paper, p. 12.)

Similarly the first letter of the legend PAOPHOPO has been recorded by Mr. Thanawalla as p, but this too is inaccurate. The Scythian P bears here the phonetic character of sh exactly as it does in the case of the well-known KOPANO = Kushan.

FURDOONJEE D. J. PARUCK.

28th May, 1916.

174. ON A GOLD COIN OF THE SASSANIAN KING SHÂPÛR THE GREAT.

On the death of Hormazd II (310 A.C.), his natural heir Hormazd was set aside by the nobles, who disliked his inclination

¹ A more interesting and to my mind more convincing example of this is to be found in the mute vowel Ъ which forms the termination in Cyrillic characters of practically every Russian word ending, as far as its pronunciation is concerned, in a consonant.—H. N.

towards Hellenic culture, and a posthumous son, the famous Shâpûr II, was elected to occupy the throne even before he was born, the coronation ceremony being performed immediately after the Mobed's declaration that the embryo was of the male sex! This monarch reigned for the extraordinarily long period of seventy years and was a contemporary of no fewer than ten Roman Emperors beginning with Galerius and ending with Valentinian II.

Shâpûr dealt a heavy blow to the Romans by conquering the five provinces beyond the Tigris and several other fortresses in 363 A.C. The Romans were utterly routed and Julian was killed. Thus gloriously for Iran closed the long series of campaigns waged by Shâpûr, who was deservedly termed the "Great" for having raised Sassanian Persia to a position higher than any it had occupied in the past.

Shâpûr the Great, who passed away in 379 A.C., was of superb physique and remarkable valour, and was well served by a devoted people. He possessed not only military talents of a high order, but also tenacity of purpose that was lacking in many members of the dynasty. He founded many cities.

Shâpûr left Persia at the zenith of her power and glory, in possession of favourable treaty with the great Western Power at whose prestige he had dealt a deadly blow, and with no powerful enemy threatening the eastern boundaries.

Shâpûr was surnamed by the Arab authors Dhou'l-aktaf, "Lord of the Shoulders," without doubt on account of his bodily strength. The Pahlavi expression is not known. Masaudi says that he gained this appellation from having dislocated the shoulders of his captives, the Arab pirates of his maritime borders. Mirkhond says he strung his prisoners together by piercing a hole through their shoulders. Gibbon erroneously spells the title Dhulaknaf or Protector of the Nation. (See also Noeldeke, Tabari, p. 52, and *Journal Asiatique*, December 1841, p. 510.)

The ancient orthography of the name Shâpûr was in Persian Shâhpûtra, "son of a king," which we find in the Cuneiform inscriptions under the form Kshathiya puthra. In the inscriptions of Naqshi-Rajab, Hâji-âbâd, Tâqi-Bostân and Takht-i-Jamshed the name of Shâpûr is found as Shahpûhri (with the final i the nominative sign). The form under which this name (Sapor) has come down to us is the transcription of Greek contemporaries authors Σαπωρ with the ω for our knowledge that the Persians pronounced the double syllable of the word pûr or pour with one long vowel. But the form Σαβωρ also occurs among the authors of the Sassanian epoch. Cunningham has published (*Num. Chron.*, 1893, p. 173, pl. IV) the copper coins of the type of Shâpûr II struck probably in the distant provinces, with a legend in Kushan characters where it is read

Shâboro. Lastly, on the Sassanian engraved gems we find the form Shâpouh.

In the inscription A of Tâqi-Bostân deciphered by S. de Sacy in 1809, Shâpûr II styles himself:—Mazdaïasn vohiâ Shah-pûhri malkân malkâ Airân ve Anirân, minochetri men Yazdân, bara mazdaïasn vohiâ Auhrmazdi . . . napi vohiâ Narsahi malkân malkâ. "The Ormazd-worshipper, excellent Shâpûr, king of kings of Irân and non-Irân, of divine origin from God, son of the Ormazd-worshipper, excellent Hormazd, grandson of the excellent Narses, king of kings."

Mordtmann describes under No. 270 (Z.D.M.G., 1880, p. 66) a drachme of Shâpûr II showing on the reverse a word which he read Yazdikert. Thus he discovers and introduces a king of this name (other than the three already known) who revolted against Shâpûr and whose reign was very short; but the existence of this Yezdegerd is not mentioned by the historians or any other writer. The reading of Mordtmann is very contestable in view of the facsimile that is given of the legend.

Description of the Coin.

Metal—Gold.

Weight—110 grains.

Size—·78".

Obverse.—The bust of king to right, wearing a mural crown with three points embattled, surmounted by the traditional globe, with the fillets of the diadem floating behind the head. The hair is brought back and arranged in a cluster of locks. A moustache and a short curly beard, an earring and a necklace of pearls with jewels in front. Bust clothed in dress.

In front of the face instead of a legend, a succession of dots parallel to the grênetis.

The whole device enclosed in a grênetis.

Reverse.—The fire-altar similar to those of Ardeshir I without the side personages. Fillets are floating from both sides of the upper base of the altar, the column of which is fluted.

On both sides of the fire parallel to the grênetis, an illegible legend. Grênetis.

As far as I am aware with few rare exceptions all the gold and silver coins of Shâpûr that have been published have some legend on the obverse whether legible, barbaric or indistinct, whereas this coin has no legend whatever on the face. Mordtmann (Z.D.M.G., 1880, p. 149) gives the number of the gold coins known to him of this king to be 18. Since then the Catalogue of the Indian Museum, Calcutta (vol. I, 1906) published three more. One is in the cabinet of Mr. Maneck R. Settna and this one of mine bring the total number of known gold coins of Shâpûr II to 23.

Obverse.



Reverse.



FURDOONJEE D. J. PARUCK.

31st May, 1916.

175. THE WEIGHTS OF AURANGZEB'S DĀMS.

I do not know if the attention of students of Mughal numismatics has been ever arrested by the change which is observable in the weights of all those Dāms of Aurangzeb's which were issued *after* the fifth regnal year. There are four examples only of Aurangzeb's copper coinage in the Indian Museum. All the four weigh between 210 and 215 grs. only (Nos 1646—1649), and the two which bear dates are of the 8th and 39th years. The Panjāb Museum contains in all 41 specimens, of which six are fractional pieces of 30, 37, 61, (2), 90 and 150 grs. (Nos. 1980, 1991, 1986—7, 1953 and 1970). Of the rest, only nine have weights ranging from a minimum of 285 to a maximum of 320 grs. It is unfortunate that all but three of them are not dated, but those three (Nos. 1967, 1968, 1978) are of the fourth and fifth years. An overwhelming majority, *viz.* 25, weigh much less; No. 1969 falls so low as 190 grs., and the heaviest (No. 1982) does not rise above 217. These light coins come from different mints in all parts of the Empire—Akbarābād, Bairāt, Haidarābād, Surat, Shāhjahānābād, Katak, Lāhore, Macchlipatan, Multān and Nārnol, and their dates range from the seventh year to the forty-ninth. At the same time, there is not a coin of the heavy type which is of any year subsequent to the fifth. It is evidently impossible, under the circumstances, to attribute the decline in weight to the dishonesty or caprice of an individual mint-master or governor of a province. It is equally difficult to suppose that it was part of a scheme for the debasement of the currency, by a government hanging on the verge of bankruptcy, for no synchronous diminution in the weight or standard of fineness of the Muhr or the rupee is perceptible. Nor are there any signs, at least in the first five years of this very long reign, of an exhausted treasury or even of financial embarrassment. What then is the explanation? I beg permission to quote *in extenso* two passages on the subject from the *Mirāt-i Ahmadi*:

چون در آن ایام جنس مس رو به کمی آورده بود صرافان بلدة احمد آباد پول سیاه آهنی را رواج داده بتوخ گران می فروختند ازینجهت مهابت خاں از اطراف مس بسیار طلبداشته در وزن نسبت به پول سیاه سابق چیزی کم کرده بسکه مبارک رسانیده رواج داد و به داروغه دار الضرب سند داد که حاصل پول سیاه معاف باشد چون داروغه این معنی را بدیوان صوبه اظهار نموده گفت بدون سند حضور حاصل پول سیاه نمی توانم گذاشت ناظم در جواب آن گفت که اگر این سند در درگاه عالم پناه منظور می افتد بهتر و الا بذه حاصل یک سال بخزانة عاصره عاید خواهد کرد چون حقیقت صدر از روی وقایع بعرض اقدس رسید حکم جهان مطاع عالم مطیع بنام دیوان صوبه کرامت صدور یافت که دام بوزن چهارده ماشه مقور شد و بسکه مبارک رسانیده رایج گردانند و حاصل یک سال معاف دانند *

This passage occurs in a chapter of which the heading is, "The Fixing of the Weight of the Dām at fourteen Māshās."

(مقرر شدن دام بوزن چهارده ماشه)

Mirāt-i-Ahmadi, Bombay Lithograph, 1307 A.H.

Part I, pp. 279—280.

"As in those days, the commodity, copper, had become scarce, the money-changers of the city of Ahmadābād had black coins of iron [made and] circulated, and they exchanged them only at exorbitant (*lit.* heavy) rates. Consequently, Mahābat Khān [the Subahdār of Ahmadābād] ordered out a large quantity of copper from all quarters, and had it stamped with the auspicious name, though a slight reduction was made in the weight, in comparison with the old copper (*lit.* black) coins. He issued to the Superintendent of the mint a *sanad* (authority, voucher) for writing off the annual profit made from the copper (*lit.* black) coinage. The Superintendent reported the matter to the *Diwān* [the chief Financial Officer] of the *Subah*, who declared that without a *sanad* (authority or sanction) from His Majesty, he could not forego the said revenue from the copper money. The Governor of the Province replied that if his *sanad* was upheld by the Court, which was the Asylum of the Universe, it would be [so much the] better; otherwise, his humble self (*lit.* the slave) would [out of his private purse] pay to the Public Treasury the amount of annual revenue [made by the State from the copper coinage]. When the above-mentioned fact reached the August Presence through the Reports [of the Official Newswriters], an Imperial (*lit.* universally-obeyed and world-subduing) mandate was beneficently addressed to

the Diwān [to the effect] that the weight of the Dām was [now] fixed at 14 Māshās, that pieces of that weight should be coined and circulated, and that one year's revenue of the mint was not to be accounted for (*lit.* excused, foregone)."

The second passage is as follows:—

مقصودیان عمارات باغات و دیگر کار خانجات بلده احمدآباد بدرگاه عرش
استیفاء التماس نمودند که قبل ازین در اجوره مزدوران وغیره فلوس که بوزن
بیست و یک ماشه بود تنخواه می شد و از ابتدای ماه شوال سده مذکور
[۱۰۷۶] رواج فلوس مذکور بر طرف گردید فلوس سکه مبارک عالمگیری که
بوزن چهارده ماشه مقرر گشته رائج شد مزدوران عوض فلوس سابق سکه حال
نمی گیرند و میگویند که تفاوت ده پانزده دارد چون این معنی بعرض مقدس
رسید بدیوان صوبه حکم شد که بقوارده پانزده یومیه بجای تنکه تنخواه
میداده باشند از آن روز در گجرات تنکه سه فلوس مقرر شده *

(*Mirāt*, Part I, p. 282, ll. 4–11).

"The Mutasaddis (officials) in charge of the garden-houses and other Kārkhanās [public establishments] of the city of Ahmadābād represented to the celestial court that the wages of day-labourers and others had been formerly paid in a *Falūs* weighing 21 Māshās; but the circulation of the said *Falūs* had been suspended (*lit.* laid aside) since the beginning of the month of Shawwāl of the aforesaid year [1076 A.H.], and a [nother] *Falūs* of the auspicious 'Ālamgiri stamp, of which the weight had been fixed at 14 Māshās, had become current; that the day-labourers refused to accept the present coins in lieu of the old (*lit.* former) *Falūs*, and said that the one differed from the other as ten [differs] from fifteen. When this fact reached the August Presence, the Diwān of the Subah received orders to the effect that in the payment of daily wages, the value of the *Tankā* in *Falūs* should be raised in the proportion of ten to fifteen. From that time, the *Tankā* has been fixed in Gujarāt at three *Falūs*."

It would appear that the price of copper had, for some reason, gone up considerably at this time, that the merchants, as well as the state, had ceased to get copper money coined on account of the little or no profit left to either by the rise in the cost of the metal, and that the deficiency of the chief circulating medium of the poorer classes was productive of great inconvenience. It must be borne in mind that the Mughal system was a system of *free coinage in all the metals*. In other words, any private individual had the right of bringing bullion to the mint in *any* quantities, and have it coined on defraying

the actual cost of coinage (or 'brassage'), at certain specified rates, and paying a seigniorage of about five per cent. The regulations on the subject may be found in a chapter of the *Āin-i Akbari*, headed the 'Profit of the Dealers in Gold and Silver,' from which the following lines relating to the coinage of copper will bear to be quoted:—

"1044 dāms buy one *man* of copper, *i.e.* at the rate of 26*d.* 2½*j.* per sér. Out of this quantity one sér is burnt away in melting; and as each sér yields 30 dāms, there are coined altogether 1170 dāms, from which the merchant takes his capital, and 18*d.* 19½*j.* as profit; 33*d.* 10*j.* go to the workmen; and 15*d.* 8*j.* for necessaries (*viz.* 13*d.* 8*j.* for charcoal; 1*d.* for water; and 1*d.* for clay); 58½*d.* go to the State."—*Blochmann, Āin*, Tr. I, p. 38.

It is easy to understand that the wages of the workmen and the cost of the "Necessaries" would not be at all affected by an extraordinary rise in the price of copper. It would be the profit of the merchant (about 19 dāms) and the seigniorage (58½*d.*) which would be in danger of being considerably reduced, if not extinguished.¹ It is also evident that under such circumstances, it would be to the interest, neither of the merchant nor of the State, to invest capital in the coinage of copper pieces of the *normal* weight, as neither could be expected to sacrifice private advantage on the altar of public convenience. The action of the Subahdār is therefore easily intelligible, and we can recognise the necessity of reducing the weight of the coins.

We are expressly told in the second passage from the *Mirāt* that the weight of the old *Falūs* was 21 Māshās. We learn from the first that the new dām weighed only 14 Māshās. Abul Fazl states that the weight of Akbar's dām was 1 *Tola*, 8 Māshās and 7 *Surkhs* or 20⅔ Māshās, which is only ⅓ of a Māshā or one *Surkh* (*Rati*) short of the weight given by the *Mirāt*. It is not perhaps unworthy of notice that the actual weight of two of

¹ The *Mirāt-i-Ahmadi* tells us that the annual profit made by the Ahmadābād mint was 6,174,500 dāms. Part II, 122, ll. 12-13.

NOTE.—The last passage quoted by Mr. Hodiwala does not hold for all the mints. Heavy dāms were struck at *e.g.* Jahāngīrnagar and Shāhjahānābād (?), but light dāms issued from such Southern Indian mints as Sholāpūr. It is certainly curious that we have not yet found any Lāhore copper coins between the reigns of Aurangzeb and 'Ālamgir II. The copper coins of Jahāndār and Farrukhsiyar are usually of light weight, but I possess a Farrukhsiyar dām weighing 322 grains. Murād Baksh struck a copper coin at Sūrat (only 2 specimens known) weighing 316–333 grs.

As regards the copper coins published by me in N.S. XV as coins of Shāh 'Ālam Bahādur probably struck at Shāhjahānābād, I am convinced that they are issues of Shāh 'Ālam Bahādur, but the mint is puzzling. Obviously the dies were made by a very poor artificer.

R. B. WHITEHEAD, I.C.S.

Aurangzeb's dāms of the old type is 320 grs. (P.M.C. Nos. 1966-7) and that this gives a value of, at least, $15\frac{1}{2}$ grs. ($\frac{320}{21} \times \frac{1}{2}$) for the *Māshā* and of 182 $\frac{1}{2}$ grs. ($\frac{320}{21} \times 1\frac{1}{2} = 182\frac{1}{2}$) for the *tolā* of Aurangzeb. Again, one of the *Falūs* of the new type weighs as high as 217 grs. (P.M.C. No. 1982), which weight, divided by 14, gives a value for Aurangzeb's *Māshā* of exactly $15\frac{1}{2}$ grs. and one of 186 grs. for the corresponding *Tolā*.

The last two sentences of the second passage are somewhat obscurely worded, but the meaning is, I think, fairly clear.

"When this fact reached the August Presence, the Diwān of the Subah received orders to the effect that in the payment of daily wages, the value of the *Tankā* in *Falūs* should be raised in the proportion of 10 to 15. From that time, the *Tankā* has been fixed in Gujarāt at three *Falūs*."

These words signify that the *Tankā*—the heavy Akbarshāhi *Tankā* of about 640 grs.—had an exchange value of two *Falūs*, when the latter weighed as much as 21 *Māshās* (or about 320 grs.), but that the same piece had now become equivalent to three of the new *Falūs*, of which the weight was only 14 *Māshās*. In other words, the weight of the new *Falūs* was to that of the old as 14 is to 21, or as 10 is to 15 or as 2 is to 3. The exchange value of the Akbarshāhi *Tankā* also, with respect to the new *Falūs*, rose therefore from 10 to 15 or from 2 to 3, and the Diwān received orders to pay, wherever an Akbarshāhi *Tankā* had been paid before (to the labourers, etc.), three *Falūs* and not two.

One thing more perhaps demands notice. According to the *Mirāt*, the first order on the subject was passed by Aurangzeb only in 1076 A.H. and the second in 1077 A.H. But it appears from the coins themselves that the alteration had been already effected at Shāhjahānābad and Akbarābād (P.M.C. 1971-2 and 1954) in 1074 A.H. (VI-VII R). It is perhaps necessary to bear in mind in this connection, that Mahābat Khan, the Subahdār of Ahmadābād, who is said to have taken action in the matter on his own responsibility, was first appointed to that charge so early as the 16th of Zilhijja, 1072 (*Mirāt* I, p. 268) and remained in office up to the 8th of Shawwāl, 1077 (*ib.*, p. 282).

All that the writer declares is that in those days (در آن ايام), there was a scarcity of the metal and that the Subahdār was obliged to take action. The entire proceeding, the coinage of the new *Falūs*, the controversy with the Diwān, the reference to and reply from the capital, probably took some time, and we may reasonably suppose that when the Emperor passed final orders on the subject, he merely authorized the Superintendent of the provincial mint to follow, in the matter of weight, the standard already fixed for the metropolitan establishments of Akbarābād and Shāhjahānābād.

So far as to the metrology of Aurangzeb's *Falūs*. The

copper coins of Shāh Ālam I are extremely scarce. There is not a single specimen in the Indian Museum, and there are only two in the great collection of the capital of the Panjāb, though the last three years of that Emperor's life and reign were passed at Lāhore. A third specimen of Shāhjahānābād mint (?) is mentioned by Mr. Whitehead (Num. Sup. XV, art. 89, p. 661), but its attribution to Bahādur Shāh, Shāh Ālam I is not free from doubt. The first of these coins weighs 315 grs. (P.M.C. No. 2096), the weight of the second is not given, and that of the third is 330 grs. A passage in the *Mirāt* shows that here also the son discarded the standard set by the father.

و نیز حکیم معلی صادر شد که پول سیاه دام عالمگیری را شکسته بوزن
عهد پادشاه غفران پناه که بوزن بیست و یک ماشه [بود ؟] به سکه مبارک
رسانند چنانچه در آن وقت پول سیاه بآن وزن تا مدت رائج گشته بود بعد
آن بهمان وزن عالمگیری عود نمود *

(*Mirāt*. I, p. 405, l. 17, to 406, l. 1)

The passage occurs in the author's account of the year 1120 A.H. and may be thus translated:—

"Likewise, the exalted Mandate was issued [to the effect] that the black money of the 'Ālamgiri Dām should be broken up and stamped again with the auspicious name [of the Emperor], of the weight [obtaining] in the days of the Emperor under the protection of the [Divine] Pardon, [Shāh Jahān], which was 21 *Māshās*. So, black money of that weight was current for a time (*Muddat*), but afterwards, it reverted to that same 'Ālamgiri [standard of] weight."

Of the statement made in the last part of the second sentence also, we have unexpected confirmation in the weight of the copper coin of Akbarābād mint (210 grs.) which Mr. Whitehead has attributed, on apparently good grounds, to Farrukh Siyar (Num. Sup. XV, art 89, p. 663).

S. H. HODIVĀLĀ.

Junagadh.

176. SOME HEAVY RUPEES OF BAHĀDUR SHĀH SHĀH 'ĀLAM I.

I should like to say a few words about a matter to which my attention was drawn only the other day, while turning over the leaves of the Indian Museum Catalogue. In it are registered four Rupees of Bahādur Shāh Shāh 'Ālam I (Nos. 1666, 1666a [1122 A.H. IV. R.], No. 1667 [1123 A.H. V. R.] and No. 1668 [1124 A.H. VI. R.]), of which the actual weights are 184 and 185 grs. It is true that all the four coins come from the same mint—'Azimābād Patnā,—and one may be inclined to pass them

by as "freak coins" uttered by some Subahdār or Mintmaster with a craving for innovation. But the following passage from the *Mirāt-i-Ahmadi* militates against such a supposition:—

و در سال هزار و صد و بیست و دو حسب الحکم اقدس بنام دیوان صوبه
تواست ورود فرمود که درینولا حکم جهانمطاع آفتاب شعاع صادر شد که اشرفی
و روینة سکه صباری بوزن یک توله مسکوک میکرده باشند چندی بدان وزن
سکه بعمل آمد نانی الحال موقوف گشته بدستور عهد پیشین حکم شد *

Mirāt-i-Ahmadi, Bombay Lithograph, 1307 A.H.

Part I, p. 408, ll. 10-13.

"And in the year 1122, a *Hasb-ul-Hukm*¹ was graciously ordered to be issued to the Diwān of the Subah in these words: 'The Mandate which is universally obeyed and [dazzling] like the rays of the sun is now issued that the *ashrafi* and the rupee bearing the auspicious coin-legend should be made equal in weight to a *tola*.' For some time this was observed, with respect to the weight of the coins, but it was soon afterwards suspended, and orders were issued for following the practice of former times."

There is a reference to this innovation in Khāfi Khān also, which may be quoted from Dowson's translation:

"Directions were given [in 1119 A.H.] that the new rupee should be increased half a *Māshā* in weight, and *lacs* were accordingly coined of that weight; but as in the payment of *tankhwāh* and in commercial transactions, it was received at only the old rate, the new rule was discontinued."

Elliot and Dowson, VII, p. 393.

These statements are clear and explicit, and show that these comparatively heavy rupees were struck in pursuance of the express orders of the Emperor. These coins are now, of course, rare, as they must have been melted down, and otherwise driven out of circulation in accordance with the so-called Law of Gresham.

There are, as I have said, only four specimens in the Indian Museum, but it is just possible that some of the 94 rupees of Bahādur Shah Shāh 'Ālam I which are registered by Mr. Whitehead, in the P.M.C., may be of this heavy type, though the weights are not recorded.

It is clear that the Imperial desire to make the rupee uniform in weight with the *tola* was not gratified, for the reasons mentioned, and this is stated by both our authorities in unmis-

¹ *Hasb-ul-Hukm*. A patent or order under the seal of the vizier, with these initial words signifying, 'according to command.' Gladwin, Bengal Revenue Accounts, 1796, p. 113.

takeable terms, though they differ as to the first year of issue. But the specimens in existence indicate that in the province of Behār at least, the Prince Governor ('Azim-us-Shān) continued to strike these heavier coins much longer than in any other part of the Mughal dominions, probably on account of his knowledge of the keenness of his Imperial father for an alteration of the standard. The earliest date on these specimens is 1122 A.H., and this may be urged, in favour the contention by the *Mirāt*, that the first year of issue was 1122 A.H. instead of the 1119 A.H. of Khāfi Khān, who is often inaccurate in chronological matters.

But this is not all that these passages tell us. It is obvious that if the *actual* weights of the coins, which were intended to be equal to the *tolā*, are 184 and 185 grs., the *tolā* itself must have weighed *at least as much*, if not a grain or two more, in the time of Bahādur Shāh Shāh Ālam I. The bearing of this fact on the question of the weight of the *tolā* of Akbar and of the Mughal period in general, is evident; but this question must be reserved for another occasion.

S. H. HODIVĀLĀ.

Junagadh.

177. THE MINT NAME SRINAGAR.

The identity of the mint name Srinagar, which occurs on several issues of the Akbari period, with the capital of Kashmir, has been the subject of considerable doubt and difficulty. Mr. H. Nelson Wright has summed up the case with an evident leaning to the other side, thus: "'The capital of Kachemir,'" says Bernier (Constable's edition, p. 397), 'bears the same name as its kingdom.' Beyond the coins alluded to, there are none in Akbar's name struck at 'Kashmir', but rupees and copper coins are known from the Srinagar mint. Whether this Srinagar is the capital of Kashmir, under its ancient and present name, or whether it is the capital of Garhwāl, is uncertain. The fact that under pre-Mughal rule Srinagar was called '*Kashmir*,' the existence of the gold coin of Akbar struck at Kashmir; and the uniform use of the name by subsequent Emperors, point to the latter view. The name of Srinagar was restored to the capital of Kashmir by the Sikhs in 1819." (I.M.C., p. lvii). I must confess my inability to accept the Garhwāl hypothesis and I beg to be permitted to challenge the grounds on which it is based. I submit that the factor which is really "uncertain" is the existence of the Srinagar of Garhwāl at all, in the reign of Akbar, and I venture to add that even if it were possible to advance any convincing proof of that existence, there is nothing whatever to show that Akbar had been able to establish his authority permanently there.

The history of Garhwāl is veiled in considerable obscurity,

but the little that is known points to Srinagar having been founded by a Rājā named Mahipat Sāh, some time after the seventeenth century had begun.¹ (Imperial Gazetteer, Ed. 1908. XXIII. 105; XII. 165). The Imperial Gazetteer is not a primary authority, and the source of the information is unfortunately not mentioned; but the statement is, for all that, not unworthy of attention. But whether the Gazetteer is wrong or right, it is certain that no reference to the Srinagar of Garhwāl has been found in the Musalmān histories that have been published, which is earlier than the eighth year of the reign of Shāh Jahān (1044 A.H.). It is unfortunate that the chapter of the Bādshāhnāmāh of Abdul Hamid Lāhori, in which the first Mughal invasion of the Srinagar of Garhwāl is described, has been omitted in Dowson's translation. It is headed "Capture by Najābat Khān of some of the forts of the Zamindār of Srinagar and his disastrous retreat (*lit.* disappointed return) on account of mismanagement." The heading itself is significant, and the gist of it is that Najābat Khān, Faujdār of the *Dāmān-i-Koh* of the Subah of the Panjāb, volunteered his services against the Rājā of Srinagar. *He would compel the Rājā to promise a tribute*, and if he refused, he (Najābat Khān) would deprive him of his territory, provided the Emperor gave him two thousand horsemen in addition to his own territorial forces. His offer was accepted, and after taking several fortresses (Sherghadh, Kālpi, Birāt, and Santur) and defeating the enemy at a place called Kotal Talāo, he arrived within thirty *kos* of Srinagar. The Rājā promised to pay ten lakhs to the Exchequer, and to make a present of one lakh to Najābat Khān himself within a fortnight. But finding that Najābat's supplies had run short, and that his troops were without food, he devised all sorts of excuses and, eventually, paid only one lakh after a month and a half. The winter then came on, the passes were closed by the Garhwālis, and Najābat had to beat a shameful retreat with the loss of almost his entire army. (Bādshāhnāmāh, Bibliotheca Indica Text, Vol. I, part II, pp. 90-93). The story of this abortive attempt to conquer Srinagar is told in his usual manner, with several exaggerations and comical additions, by Manucci, who says that the Rājā was known in his own day as Nactirānī (Nāk-Kati Ranā) (Nose-cutting Rājā), on account of his having granted their lives to Najābat Khan and his soldiers only on condition of their leaving their noses behind them. (Irvine, Manucci's Storia do Mogor, Vol. I, 215-6 and note). The *Māasir-ul Umarā* gives a different explanation of the origin of this curious sobriquet (Vol. III, 822-24), but it confirms the account of Najābat Khan's failure, and there can be no doubt that the Mughals were unable to establish their authority in Garhwāl, or

¹ No. 525a I.M.C. is of the 42nd year (1596-7).

at least in that part of it in which Srinagar is situated, before 1065 A.H. (1654-5 A.C.). In that year Khalil-ullāh Khān was despatched at the head of another expedition. (Elliot and Dawson, Vol. VII, pp. 105-6). It was only after this that the Rājās of Srinagar became tributary to the Emperors of Dehli, and it was a Rājā of Srinagar with whom Sulaimān Shikoh took refuge and by whom he was surrendered to Aurangzeb.

It is not denied that some parts of Kumāon had been raided occasionally during the half-century of Akbar's rule, but one has only to glance through these passages to realize that there is no mention whatever in them of Srinagar or of the district in which it is situated. It is true also that a Rājā of Kumāon (Almorā), Rudra Chand, came to Amanābād near Lāhore, under the escort of Kaliān, the son of Todarmal, and was induced, with some difficulty, to make his obeisance to Akbar in 997 A.H. (1587 A.C.) [Akbar-nāmah, Bibl. Ind. Text, III, pp. 533 and 537; Badaoni, Trans. Lowe, Vol. II, p. 377¹]; but he did so in all probability because he had an old feud with the Rājā of Garhwāl and hoped to wrest, with the assistance of the Mughal, some of those territories which he had himself unsuccessfully invaded only a few years before (1581 A.C.). Imperial Gazetteer, Vol. XII, 165. I have said that Srinagar is nowhere mentioned in the account we possess of the occasional raids into Kumāon which were undertaken by Akbar's generals. An examination of the names of the twenty-one Mahāls of the Sarkār of Kumāon which are given in the *Ain-i-Akbari*, and in which Srinagar is conspicuous by its absence, confirms this view. (Jarrett, *Ain*, Trans. II, 289). The following extracts from the District Gazetteers of British Garhwāl and Almora confirm almost everything that has been said above. The writer of the historical chapters in both, Mr. H. G. Walton, I.C.S., says that they are almost entirely reproduced from the excellent account in Atkinson's "Himālayan Gazetteer."

Speaking of Garhwāl, Mr. Walton says:—

"The date of a subsequent Rājā, Mānsāh, may be fixed by an inscribed grant he has left, about 1547. Mānsāh was succeeded by Sāmasāh and he by Dularām Sāh, the first of his line to come in contact with the rising power of the Kumāon Chands. At this time Rudra Chand (1565-1597) was supreme in Kumāon, and having reduced Sera in the east, sought to add to his dominions also Badhan in the valley of the Pindar, a part of the territory of the Rājā of Garhwāl. * * *. Rudra Chand died in 1597 and was succeeded by his son, Lakshmi Chand.

¹ Badaoni says: "In this year the Rājā of Kumāun, who had never, nor his father nor grandfather before him (God's curse be upon them!), seen an Emperor, even in imagination, came from the Sāwālik Hills to pay his homage to the Emperor at Lahore." If the expressions are characteristic, they are also highly significant.

This prince, desirous of carrying out his father's policy, seven times invaded Garhwāl, but was each time repulsed with loss. * * * *At this time the reigning Rājā of Garhwāl was Mahipat Sāh, of whom little is known except that he removed the capital from Dewalgarh to Srinagar, and is traditionally said to be the first Rājā who consolidated the rule over Garhwāl.* * * * Akbar's Sarkār of Kumāon contained twenty-one Mahāls, but none of these seem to have been situated in the hills. * * * Whatever the reason may have been, the Muhammadans do not ever seem to have subjugated the hill rājās, though some expeditions successful to a certain extent, as far as the partial Muhammadan historians may be trusted, were fitted out. In 1654-55 Khalil-ullāh Khān was despatched with 8000 men to coerce the "Zemindar of Srinagar," the only title then conceded to the Rājā of Garhwāl at that time, Pirthi Sāh, the successor of Mahipat Sāh. The hostile force met with little resistance and speedily overran Dehrā Dūn, then subject to the Garhwāl Rājās, but did not penetrate within the hills." (District Gazetteers of the United Provinces, British Garhwāl, pp. 115-117).

In the Volume on Almorā we read :—

"At the same time, the negative testimony of the *Āin-i-Akbari* proves conclusively that no portion of the hills ever paid tribute to Akbar." (District Gazetteers of the United Provinces, Almorā, p. 172).

But if there is no reference to the Srinagar of Garhwāl in the Mughal annals before the reign of Shāhjahān, how does the case stand with respect to the Srinagar of Kashmir? Neither Badāoni nor Nizāmu-d-din Ahmad of the *Tabaqāt-i-Akbari* is acquainted with any other Srinagar than that of the Happy Valley. (Lowe's translation, Vol. II, 365; Elliot and Dowson, Vol. V, 454, 457). The same is the case with the *Āin*, which explicitly states (Jarrett, II, 355 and 384-5) just as do Badāoni and Nizāmu-d-din (Lowe II, 365; Elliot and Dowson, V, 454), that Srinagar was the capital of the country.¹ It is true that the *Akbarnāmah* once mentions a Thānā of the name of Srinagar in Bengal. (Bibl. Ind. Text, III, p. 824); but such a place cannot have any connection with the point in dispute. All the other eleven references to Srinagar in that "continent of a book" (Vol. III, pp. 506, 507, 542, 543, 553, 565, 623, 624, 630, 726, 729), of which the earliest belongs to the 31st Regnal year (994 A.H.) and the latest to the forty-second (1005 A.H.), are applicable to that city only, which is repeatedly called the دارالملک (Metropolis) of Kashmir. (*Ibid.* III, 542, 624).

¹ The Srinagar of Kashmir is mentioned also on pp. 311 and 368 of Jarrett, *Āin*, II.

It may be true that the coins of all the Emperors after Akbar are marked by the "uniform use" of the name "Kashmir" for the city, but it is also a fact that *Srinagar*, as the name of the capital, never actually disappeared from either the popular or the official cognition after the death of Akbar. The Emperor Jahāngir, who apparently was the first ruler to banish Srinagar from the mints, himself states in his Autobiography, that "the name of the city was Srinagar" (*Tūzūk*, Trans. by Rogers and Beveridge, Vol. II, p. 141), and this he does in his account of the *fifteenth* regnal year (1029-30 A.H.).¹ The *Khulāsat-ut-Tawārikh*, as well as the *Chahār-Gulshan*, which were both compiled from official records of the seventeenth and eighteenth centuries, agree in recognising Srinagar as the capital of the country. (Sarkār, India of Aurangzeb, pp. 111 and 132). But granting that the chief city of Kashmir was never spoken of as Srinagar between the year of Akbar's death and the conquest of the province by the Sikhs in 1818 A.C., this does not at all affect the point at issue, for the coins before us are the coins not of any of Akbar's successors, but his own.

The fact is that both names—Kashmir as well as Srinagar—were used for the metropolis, even in Akbar's time. Badāoni speaks in a passage, which Lowe has misunderstood, of the city of Kashmir (در نزدیکی شهر کشمیر) "near the city of Kashmir").

Text, Vol. II, pp. 369-370.² In the *Tabaqāt-i Akbari* also, Kashmir is spoken of both as a city and a country. (Elliot and Dowson, Vol. V, pp. 464-5). I submit therefore that there is no reason for not attributing the Srinagar issues of Akbar to the metropolis of Kashmir, and we must take it that one city was called by two different names on the coins—a phenomenon to which several parallels can be found in Indian numismatics.

S. H. HODIVĀLĀ.

Junagadh.

178. BAHĀDURGARH.

"Bahādurgarh, with its alternative names of Nandgāon and Bikāpur (*sic*), is given by Jadunāth Sarkār in his "India of Aurangzeb" as one of the forts in the province of Aurangābād." (Whitehead, P. M. C. lvii). Mr. Sarkār's authorities are the *Chahār Gulshan* and Tieffenthaler (I. 479). The former asserts that the old name was Bikāpur (Sarkār, p. 163). The

¹ "Ten thousand Rupees were given for the expenses of the *bulghūr-khānā* of Kashmir to the *wakil* of Mirzā 'Ali Beg, the governor of that place, to send to Srinagar." *Tūzūk*, Tr. Vol. I, p. 77.

² Lowe read this *در نزدیکی شهر کشمیر* and translated it as "near one of the cities of Kashmir," but he saw that it was Srinagar that was meant (II, p. 381 and note).

latter declares that it was Nandgāon. (Sarkār, p. lxxxvii). The *Chahār Gulshan* itself is not a work of the highest authority, and the solitary manuscript on which Mr. Sarkār had to rely was admittedly full of blunders, being characterized as the work of a scribe "more remarkable for the beauty of his penmanship than the soundness of his Persian scholarship" (*ib.*, p. xxi). It is clear, therefore, that we must have, for a satisfactory identification, some more convincing and reliable authority. Now Grant Duff states:—"The viceroy [Khān Jahān Bahādūr] went in pursuit of them [the Mahrāttās who had appeared in different parts of Aurangābād and Ahmadnagar] in various directions, but without success, and at last, cantoned for the rains at Pairgāon on the Beemā, where he erected a fortification and gave it the name of Buhādurgarh." The historian of the Mahrāttās places the event in 1672 A.C. and adds in a footnote that the place "does not retain this name, but continued upwards of forty years, one of the principal depots of the Moghal army." (*History of the Mahrattas*, Reprint, 1873, p. 114 and note). Grant Duff's authority for the statement was the Bundela Officer's Narrative in Jonathan Scott's Dekkan, where we read:

"Bahadur Khān, learning that the Mahrattas were collecting in the neighbourhood of Poonāh, left his baggage at Chummar Koondah, and by forced marches came up with and gave them a signal defeat, in which Sookern Bondela behaved with particular gallantry. He then moved to Burragnum, twenty coss distant from Ahmednuggur, on the banks of the Beemrah, a river separating the Hyderabad territories from those of Bijapur and which has its source from the mountains of Kokun at a place called Bhameeau Sunkeree, near the fort of Loeghur. Here Bahadur, to perpetuate his memory, built a fort and erected a magnificent palace which he called Bahādurgurh." J. Scott, Ferishtā's *History of the Dekkan*, vol. II, pp. 34-5.

Let us now see what we can glean about Bahādurgarh from the Musalmān chronicles themselves.

In the first place then, I find Khāfi Khān saying

و وسط ماه رجب [۱۱۱۶] از آن مکان [دیوگانوں] کوچ فرموده
متوجه بہادر گڑھ عرف بیرگانوں شدند *

Bibliotheca Indica Text, II, p. 539, ll. 16-17.

"And in the middle of the month of Rajab [1116 A.H.] he [the Emperor] marched from that place [Deogaon] towards Bahādurgadh, otherwise called Baigāon."

This older form Baigāon also occurs by itself in Khāfi Khān's Text on p. 449 (1107 A.H.), p. 460 (1110 A.H.), and p. 503 (1113 A.H.), and the variant readings given by the Editor are بیرگانوں - برگانوں - بیدگانوں (Text. II, pp. 449 and

460, notes). The old name occurs also, though only once in the *Ma'āsiri-i-'Alamgiri* as پیدگانو (Paidgāon) (Bibl. Ind. Text, p. 409, l. 5).

The new name Bahādurgarh occurs so many as sixteen times in the *Ma'āsiri*, the earliest reference belonging to the year 1095 A.H. (p. 240). The same name is also found in Khāfi Khān, p. 383 (1101 A.H.), p. 415 (1104 A.H.), and p. 509 (1113 A.H.).

But where was this Bahādurgadh or Paidgāon or Paigāon or Baigāon? In the first place, we learn from the *Ma'āsiri* (p. 322) that it was in the neighbourhood of Akloj or Asa'adnagar, which is itself fifty-five miles N.-W. of Sholāpūr. Next Khāfi Khān informs us that a woman was carried by a flood from Bahādurgadh to Aurangzeb's camp at Islāmpūri or Brahmapūri on the Bhimā, sixteen miles S.-E. of Pandharpūr (*Imperial Gazetteer*, ed. 1908, vol. IX, p. 10), in only five or six watches. (Khāfi Khān, Text, II, p. 452). The author of the *Ma'āsiri* describes Aurangzeb's route from Khelnā or Vishālgadh to Bahādurgadh as lying through Malkāpur, Nabishāhdurg (i.e. Parnālā), Bargāon, the river Krishna and Asa'adnagar (pp. 463-468). It will be found that the Pedgāon in the Ahmadnagar district, which is on the north bank of the Bhimā and eight miles south of Shrigondā (18°37' N. and 74°42' E.) satisfies all these conditions.¹ In the Ahmadnagar volume of the *Bombay Gazetteer* we read: "About 1680, Pedgāon was one of the chief stores and a frontier post of the Moghal army, and the ruined fortifications which from a distance give an imposing appearance to the town were built by the Deccan Viceroy Khān Jahān Bahādur who camped here during the monsoon of 1672, in pursuit of Shivāji. Another of Khān Jahān's works is a fairly preserved channel or conduit for bringing water from the Bhimā. The water was raised from the Bhimā by an elephant *Mōt* and a Persian wheel. The *Mōt* and a tower for the Persian wheel are still fairly preserved. Khān Jahān gave Pedgāon the name of Bahādurgadh, which it has not retained. In 1673, the English traveller Fryer notices Pedgāon on the Bhimā, three days' journey from Junnar, where the Moghals had a large host of 40,000 horse under Bahādur Khān. (Fryer, *East India and Persia*, pp. 139, 141)." *Bombay Gazetteer*, Vol. XVII, pp. 732-733.²

S. H. HODIVĀLĀ.

Junagadh.

¹ Shrigonda or Champārgondā is 32 miles south of Ahmadnagar city (*Imp. Gazetteer*, XXII, 309).

² It need scarcely be added that Tieffenthaler's Nandgāon (نندگانو) is due to a misreading of Paidgaon, پیدگانو, as it would be written in Persian. There is a Bahādurgarh in Rohtak district, Panjāb, which is a place of some pretensions, but there is good authority for believing that

179. 'A'AZAMNAGAR.'

"The earliest coin published of the rare Southern India mint of A'azamnagar is a rupee of Aurangzeb dated 50 R. (N.S. XV. § 89). * * * There are one or two other A'azamnagar rupees exactly resembling those already mentioned, but where the mint name is accompanied by a second name, and this latter name, mainly on the strength of two published coins of Kām Bakhsh, has been read as Gokulgarh. This place which must have been in the Dakhan should not be confounded with the Gokulgarh near Delhi." (Whitehead, P.M.C., p. xli).

I may be permitted to state that A'azamnagar was the name given by Aurangzeb to the fortress of Belgām. The statements of Khāfi Khān and the *Ma'āsir-i-Ālamgiri* leave little room for doubt on the subject, though the blundering carelessness of copyists is responsible for errors which may apparently obscure the issue. In the first place, then, Khāfi Khān says that Prince Muhammad A'azam Shāh, when on the way to the conquest of Adoni in 1099 A.H., passed by the fortress of *Malgāun* ملگنوں which was one of the famous forts subject to Bijāpur. "He was told that the governor of the fortress was dead, and that the garrison had put forward his son, a boy of tender years, as Qil'adār or Commandant. Orders were issued for investing the fort, and the besieged after making futile attempts at defence submitted and delivered the keys of the stronghold, after the presentation of which it was renamed A'azamnagar" بعد عرض آن قلعه را اعظم نگر موسوم ساختند (Bib. Ind. Text, Vol. II, p. 372, ll. 3-9).

It is true that the name is written in the body of the text ملگنوں, but a footnote adds the variant reading بلگانوں. The same event, including the story of the boy-commandant, is recorded in the *Ma'āsir-i-Ālamgiri*, with this difference that the old name is clearly written بلگانوں (Balgāun), and the new name A'azamābād. A footnote records at the same time the readings ملگانوں and اعظم نگر (Bib. Ind. Text, p. 315, ll. 1-9). These discrepancies would be perplexing but for the occurrence of the double name A'azamnagar-Balgāon in another passage.

چین قلیچ خان بہادر صوبہ دار بیجاپور بخدومت فوجدارچی تلکوکن
عادلخانیاں واعظم نگر بلگانوں و تہانہ دارچی سانپ گانوں از تغیر صیف خان مقور شد *

(Bib. Ind. Text, p. 474, ll. 1-3).

it acquired that name only in the second quarter of the 18th century. Elliot, Supplementary Glossary, ed. Beames, II, 125; Imperial Gazetteer, ed. 1908, VI, 194. The coins are of the reigns of Bahādur Shāh, Shāh Ālam I, Jahāndār and Farrukhsiyar, that is, several years earlier.

“Chin Qilich Khān Bahādūr, Subahdār of Bijāpur, was, on account of the transfer of Saif Khān, appointed to the Faujdārī of the ‘Ādil-Khāni Talkokan and A’azamnagar-Belgāon and the Thānahdārī of Sāmpgaon.” [1114 A.H.].

Two years later, Saif Khān was restored, and “appointed Qil’adār and Faujdār of A’azamnagar and Talkokan on the transfer of Chin Qilich Khān.” (*Ibid.*, p. 496, ll. 4-6).

I venture to think that a comparison of these passages, one with the other, can leave little doubt as to the true readings. The two authors correct each other and also themselves, and we may take it as fairly certain that the original name was بلگانوں and not ملکانوں and that the new name was اعظم نگر and not اعظم آباد. The fact that A’azam Shāh took the fort *while on his way to Adoni*, the stress laid on its strength and renown, the connection with the Bijāpuri Talkokan and with Sāmpgaon, all go far to establish the identity of the place with the modern Belgaum. The district of Belgaum had come into the possession of the Bijāpūris after the battle of Talikotā in 1565 A.C. and remained under them until 1686 (*Imp. Gaz.*, VII, 148). Sāmpgaon is in the same district and the Imperial Gazetteer informs us that “the finest Musalmān remains in Belgaum district are the fort and Safā Mosque at Belgāum, and the mosque and tombs at Hukeri and Sāmpgaon.” (*Ib.*, VII, 148).

The following passages from the Gazetteer of Belgaum may also be quoted:—

“According to Mr. Stokes (*Belgaum*, 45), after the fall of Bijāpur, the fort of Belgaum remained for some years in possession of Aurangzeb’s second son Azam and from him was called Azamnagar. * * * The province of Azamnagar formed the western boundary of the district of Bankāpūr, and it contained within it the district of Gokāk, of which the town of Gokāk was the head place.” (*Bombay Gazetteer*, Vol. XI, 376 note). And of Gokāk, we are told that in 1685, it is “mentioned as a town of note and the head-quarters of a district or Sarkār that surrendered to the Moghals. (Orme’s *Historical Fragments*, 144, Stokes’ *Belgaum*, 43). * * * In a Marāthā revenue statement prepared about 1789, Gokāk appears under the Azimnagar or Belgāon Sarkār as the head-quarters of a parganā or subdivision with a yearly revenue of £1,125 (Rs. 11,250). Waring’s *History of the Marathas*, 245.” *Bombay Gazetteer*, Vol. XI, p. 563.

Gokāk has a very old fort and it is probably the Gokāge which is mentioned in an inscription of A.C. 1047 as having been laid siege to by Akkadevi, the aunt of the Western Chālukya king Someshwar (1042-1068). “A fort standing on an isolated peak behind the town, which is said to have been built by one of the ‘Ādilshāhi Sultāns of Bijapur, still exists.” (*Imperial Gazetteer*, ed. 1908, Vol. XII, 307).

I have no desire to say anything positive on such a matter,

but it seems to me permissible to suggest that the true reading of the Mint-nāme is "A'azamnagar Gokāk" and not "A'azamnagar Gokulgarh." I venture to add that this new reading agrees with the excellent specimen which I have seen in Mr. Thānāwāllā's cabinet and also with the traces of the name on Dr. Taylor's coin (*Num. Sup.* XIV, Plate 86, Fig. 11).

S. H. HODIVĀLĀ.

Junagadh.

180. PANJNAGAR.

The mint-name 'Panjnagar,' which appears on a single Half-Rupree of Jehāngir's, is very difficult to identify. Mr. Whitehead says that "the reading is to some extent tentative, as the place is unknown, but no other name suggests itself." (*P.M.C.* lxiii). It is possible that the discovery of other specimens may prove the incorrectness of this reading. Meanwhile, I may be permitted to say that a place of the name of Panchnagar is mentioned in the *Āin-i-Akbārī* as being included in the Sarkār of the Rechnāu Doāb in the Subah of Lāhore. (Jarrett, *Āin.* Tr. II, 320). The place must have been of some importance, as it is stated elsewhere to have given its name to one of the sixteen *mahāls* into which one of the eight *sawāds* (districts) of the whole *Subah* was divided. (*Ibid.*, p. 110). The name itself reminds one of 'Hashtnāgar', which is popularly derived from the "eight towns which are now seated close together along the lower course of the Swāt river." (Cunningham, *Ancient Geography*, p. 50). It is perhaps not unworthy of note that another locality with a similar name 'Panchgrāmi' ("five villages"?) is found in the Bāri Doab list (*Āin.* II, 318), and is also mentioned once in the Akbarnāmah, in a manner indicating that it was somewhere near Lāhore and Kāsūr. (*Bibl. Ind. Text.* III, 529).

The letters, however, which have been supposed to stand for 'nagar,' are far from clear and it is at least equally probable that the correct reading is Punch or perhaps "Punchnagar"—written with a *Pesh* or *Zimma* only, instead of a 'wāw.' The Punch or Pakli pass into Kashmir, says Vigne, which quits "the road on the second day from Bhimbūr, and joins the Baramula pass at Uri, two days from the valley, is rarely closed, either for horse or foot, all the year round." (*Travels in Kashmir*, Vol. I, 147). It was situated "on the high road of the Mogul Emperors from Lāhore into Kāshmir" (Vigne, I, 234), and there can be no doubt that Jehāngir himself passed through it at least once in his life. "As the purpose of visiting the eternal spring of the rose-garden of Kashmir was settled in my mind," says the Imperial autobiographer in his account of the Fourteenth regnal year, "I sent off Nuru-d-dīn Quli, to hasten on before, to repair, as far as was possible, the

ups and downs of the Punch route to it, and to prepare it so that the passage of laden beasts over difficult hilltops might be accomplished with ease, and that the men should not undergo labour and hardship." (*Tūzūk-i-Jahāngiri*, Tr. Rogers and Beveridge, Vol. II, pp. 97-98 and p. 133. See also Elliot and Dowson, VI, p. 367). The road through Punch is mentioned also by the author of the 'Ālamgirnāmah, who says that the distance from Bhimbar to Kashmir (Srinagar) by that route was ninety-nine Imperial koss. (*Bibl. Ind. Text*, p. 820.) A reference may be invited also to Cunningham's *Ancient Geography*, from which it becomes clear that the town lies on a high road frequented even in the time of Hiouen-Tsang, and that the name is pronounced by the Kashmiris themselves without the long 'u.' "It is called *Punje* by Wilford's surveyor, Mirzā Mogal Beg, and Punch, by Vigne, both of whom actually visited the place" (p. 128). See also *Āin-i-Akbārī*, Jarrett, II, 437, note 3. On the other hand, the attribution of the coin to Punch in Kashmir is open to the objection that in the 'Ālamgirnāmah' (*Bibl. Ind. Text*, 820), the name of that place is spelt پونچ and not پنچ. Indeed, Mr. Whitehead has provisionally recognized this پونچ as a silver-mint of Aurangzeb's in his mint-list (p. 468), and mentioned as his authority for doing so, a specimen existing in Dr. Taylor's cabinet. I say, that he has recognised it "provisionally," because it is one of the class of "Mints unverified or not quite certain, but included" (p. 429). The question that arises is, if the name of Punch in Kashmir is clearly written *with the* , on Aurangzeb's rupee, how can the پنچ of Jahāngir's coin be identified with it? It may be answered that there are several cases of the name of the same place being spelt differently on Mughal coins of different reigns, and sometimes even of the same reign. The closest parallel is of course that of اجین پور and اجین اورجین, (P.M.C. Nos. 162, 163, 575). Other examples of such diversity are seen in سرهند, بهکر and بکر; الہ اباسی and الہ آباد; اتاو and اتاوہ. A still more satisfactory reply to this argument is that Abul Fazl's spelling is پنچ (*Akbarnāmah*, *Bibl. Ind. Text*, II. 102, l. 13). It seems to me that the probabilities in favour of either of these identifications are considerable, and almost equally balanced, and that it would be hazardous to assign the coin definitely to either. Personally, I am strongly inclined to think that the true reading is still to seek, and I have written these lines only in the hope that they may help to wards a satisfactory identification if the present reading is proved to be correct.

S. H. HODIVĀLĀ.

Junagadh.

181. THE MURĀDĪ TANKĀ.

“At the present time, namely A.H. 1002, Hindustan contains 3200 towns, and upon each town there are dependent 200, 500, 1000, or 1500 villages. The whole yields a revenue of 640 crores (6,400,000,000) Murādi tankās.” So writes¹ Nizāmu-d-din Ahmad, the contemporary and well-informed author of the *Tabaqāt-i-Akbarī*. But what is the *Murādi tankā*? Edward Thomas stoutly maintained in more than one publication, that the *Murādi tankā* of Nizāmu-d-din was nothing else than the double *dām*, and as forty *dāms* went to the Akbari rupee, the *Murādi tankā* must be taken to be identical in value with the older Sikandari tankā, which was the twentieth part of the rupee. (Chronicles, Ed. 1871, pp. 441-5; Revenue Resources of the Mughal Empire, p. 7). He therefore took Nizāmu-d-din's statement to mean that Akbar's *gross* annual receipts *from all sources* amounted to 32 crores of rupees. Mr. Stanley Lane Poole, whose opinion on the subject was sought by Sir W. W. Hunter, and who has devoted an entire chapter to the question of Mughal Revenues in his Monograph on Aurangzeb, has taken a very different view. “I have not mentioned,” he says, “Thomas's theory that the gross income of Akbar in 1593 was (at 2s. 3d. the rupee) £36,000,000, because it is based on the assumption that the 6,400,000,000 *Murādi tankās* of Nizāmu-d-din Ahmad's return for that year (which I have purposely omitted in the list given above) were equivalent to *double dāms*. The terms *dām* and *tankā* are interchangeable, as is proved by the inscriptions on the coins themselves, and though there were undoubtedly double *dāms* as well as double *tankās*, there is really no valid ground for assuming in this single instance a different fiscal unit from that employed in all the other returns. * * * I therefore take Nizāmu-d-din's return to represent £18,000,000. Whilst disbelieving the *Murādi tankā* theory, however, as a ground for the higher estimate, I do not doubt that the gross revenue of Akbar in 1593 may have been quite 36 millions.” (Aurangzeb, Rulers of India Series, p. 128 note; Hunter, Indian Empire, 3rd ed., p. 353 ff.). Briefly, Mr. Lane Poole is confident that the *Murādi tankā* of the ‘*Tabaqāt*’ is nothing but the *single dām* of which forty and not twenty went to the rupee, and he does not think it probable that a monetary or fiscal unit altogether different from that employed everywhere else should have been used by Nizāmu-d-din in this solitary passage. It is now nearly twenty years since Mr. Lane Poole wrote as above, and I am not aware that any writer has challenged his statements or again discussed on its merits the *Murādi tankā* theory of Thomas. It occurred to me recently that a re-examina-

¹ Dowson's Elliot, V, p. 186. Thomas, Chronicles, p. 388.

tion of the question might not prove unfruitful, and with this object I studied in the original Persian every word of Nizāmu-d-din in his long account of the first thirty-eight years of Akbar's reign, and the second and third volumes of Badāoni's *Muntakhab-ut-Tawārikh* which are devoted to the same subject. The results of these studies I beg to be permitted to lay before the readers of this journal, as they have a bearing not merely on the question of Mughal Revenues, in which both Thomas and Lane Poole were primarily interested, but on a point of some importance in Mughal Numismatics, namely the date of the first issue of the heavy and still by no means common "*Tankā-i-Akbarshāhi*" of which but one specimen appears to have been known to Thomas, when he wrote in 1871. (Chronicles, p. 369 note).

In the first place then, I find that neither Nizāmu-d-din nor Badāoni makes use of the word *dām*. Lowe has on p. 284 of his translation the phrase, "Several krors of *dāms*," but a reference to the original (*Bibl. Ind. Text*, II, p. 276) shows that the word *dām* is there conspicuous by its absence. Both these writers uniformly employ the word *tankā* on every occasion. That word, *without any qualifying epithet*, occurs in Nizāmu-d-din in the following passages:—

- i. Seven lakhs of *tankās* given to Sayyad Beg, nephew of Shāh Tahmāsp. Regnal year VII. Lucknow Lithograph, 1292 A.H., p. 257. Elliot and Dowson, V, 276.
- ii. Three crores of *tankās*: the cost of building the fortress of Agra. R.Y. X. Luck. Lith., p. 265. E.D., p. 295.
- iii. Two lakhs of *tankās* presented to Khwājah Husain for a Qasidah. R.Y. XIV. Luck. Lith., p. 288 (not in E.D.).
- iv. Jāgir of fifty lakhs of *tankās* given to Muhibb 'Ali Khan. R.Y. XV. Luck. Lith., p. 291. E.D., p. 338.
- v. Jāgir of [two crores and] fifty lakhs of *tankās* given to Muẓaffar Gujarātī. R.Y. XVII. Luck. Lith., p. 300. E.D., p. 353.
- vi. Kroris appointed in charge of as much land as would yield a *kror* of *tankās*. R.Y. XIX. Luck. Lith., p. 323. E.D., p. 383.
- vii. Grain rose to 120 *tankās* for *man* in Gujarāt. R.Y. XIX. Luck. Lith., p. 323. E.D., p. 384.
- viii. Reservoir called Anūp talāo, filled with gold, silver and copper coins amounting to twenty crores of *tankās*. R.Y. XXIV. Luck. Lith., p. 341. E.D., p. 409.
- ix. Two crores of *tankās* given as *Mahr* or Dower to the daughter of Rājā Bhagwāndās on her marriage. R.Y. XXX. Luck. Lith., p. 366 (not in E.D.).

The passages in Badāoni are nine in number, five relating to events mentioned in the *Ṭabaqāt* also.

- I. Sixty thousand *tankās* paid to Hāsham Qandahāri for a Ghazal by Bairām Khān. 966 A.H. Bibliotheca Indica Text II. 41. Lowe II. 36.
- II. One lakh of *tankās* paid to Rāmdās Kalāwant by Bairām Khān for his music. 966 A.H. Bibl. Ind. Text II. 42. Lowe II. 37.
- III. One lakh of *tankās* given to Hijāz Khān Badāoni for a Qasidāh by Bairām Khān. 966 A.H. Bibl. Ind. Text II. 42. Lowe II. 37.
- IV. *Ṭabaqāt* passage No. I (Luck. Lith., 257. E.D. V, 276). Bibl. Ind. Text II. 52. Lowe II. 49. 966 A.H.
- V. *Ṭabaqāt* passage No. III (Luck. Lith. 288). 977 A.H. Bibl. Ind. Text II. 120. Lowe II. 124.
- VI. *Ṭabaqāt* passage No. VII (Luck. Lith. 323. E.D. 384). Bibl. Ind. Text II. 186. (صد و بیست تنگه سیاه). Lowe II. 189.
- VII. *Ṭabaqāt* passage No. VI. (Luck. Lith. 323. E.D. V. 383). Bibl. Ind. Text II. 189. Lowe II. 192.
- VIII. Qāzi Jalāl Mullāni banished for forging a draught on the Treasury for five lakhs of *tankās*. R.Y. XXVII. Bibl. Ind. Text II, p. 313. Lowe II. 323.
- IX. *Ṭabaqāt* passage No. IX (Luck. Lith., p. 366). Bibl. Ind. Text II, p. 341. Lowe II, p. 352.

In the third volume, the word *Tankās* occurs on pp. 16, 20 and 85, but the passages are not of any particular importance.

The phrase *Tankā*, with the qualifying epithet *Murādī* expressly added, occurs for the first time, in Nizāmu-d-din's account of the events of the twenty-fifth Regnal year, in which Hakim 'Alī was sent to Bijāgarh (Bijāpūr) along with the envoys of 'Adil Khān Dakhani.

چون خواجه عبد اللہ از جانبِ علمبرخان [عادلخان] آمدہ تحفہای
گواہی و فیضانِ نامی آورده بود در این ایام پرتو التفات بحالِ عادلخان انداختہ
خواجه عبد اللہ با پسرش شاہی نیک نام بغلعتِ پادشاہانہ نوازش فرمودہ یکصد
اشرفی اکبر شاہی و یکہزار و پانصد روپیہ و بے بیست و چہار ہزار تنگہ مرادی
انعام فرمودہ رخصت دادند *

Lucknow Lithograph, p. 342, ll. 13-16. Mullā Firūz Library
Manuscript, folio 340 A, ll. 12-15.

“As Khawājah 'Abdullāh had arrived with valuable gifts and elephants of renown from 'Alvi Khān ['Adil Khān], he [the Emperor] threw the glances of condescension upon 'Adil Khan,

and having bestowed princely *Khila'ats* (dresses of honour) upon Khwājah 'Abdullāh and his son named Shāhi Beg, presented to them one hundred Akbarshāhi ashrafs and fifteen hundred rupees and twenty-four thousand *Murādi tankās*, and gave them permission to return to their country.

Here Dowson has "1501 Rupees and 24 tankās," and leaves out the word *Murādi* in his translation (E.D. V, p. 411), though it is clearly written in the Lucknow Lithograph as well as in the Mullā Firūz Library Manuscript.

Badāoni does not mention Khwājah 'Abdullāh or his son by name or the presents made to them, though he does say that Hakim 'Ali was sent in company with the Dakhni envoys to Bijāgarh (Bijāpur).

The next passage occurs in Nizāmu-d-din's annals of the thirty-second Regnal year.

و همدرین شرف ایلچی عبد الله خان و نظربی و فرزندان بشرف ملازمت و کونش رسیدند و اسمعیل قلی خان و رایسنگه نیز در این روزگار کلانتران و سرداران بلوچان را آورده بعتبه بوسی معزز شدند و چهار لکبه مرادی که پانصد تومان عراق باشد بنظربی و فرزندان انعام شد *

Lucknow Lithograph, p. 370, ll. 3-5. Mulla Firuz Library Manuscript, folio 366 A., ll. 14-17.

"About the same time, when the sun was in his exaltation, the envoy of 'Abdullāh Khān and Nazar Bey, together with his sons, had the honour of paying their respects [to the Emperor] and performing the *kurnish*. And Ismā'il Qulī Khān and Rāisingh also brought the elders and chiefs of the Balūch tribes, who had the honour of kissing the threshold. To Nazar Bey and his sons were given as a present four lacs of *Murādi tankās*, which are equivalent to five hundred Tumāns of 'Irāq."

Here Dowson has again omitted the qualifying epithet *Murādi* in his version. (E.D. V, p. 453.)

The corresponding passage in Badāoni is as follows:—

و هم در روز تحویل ایلچی عبد الله خان و نظربی با فرزندان ملازمت نمودند و چهار لک تنگه بنظربی که پانصد تومان عراق باشد انعام شد *

Bibl. Ind. Text, II, p. 352, ll. 15-17. Lucknow Lithograph, p. 257, ll. 18-19.

"On the day of the sun's passing into [the first degree of Aries], the envoy of 'Abdullāh Khān and Nazar Bey with his sons paid their respects, and four lacs of *tankās* which are equivalent to five hundred Tumāns of 'Irāq were given as a present to Nazar Bey." (Cf. Lowe, II. 363).

Now it will be noticed that the word *Murāḍi* is omitted in the text of Badāoni, just as the word *Tankā* is omitted in the Lucknow Lithograph of Nizāmu-d-din. But there can be no doubt that both writers meant the same kind of *tankā*, for the numbers, *Four lākhs* and *five hundred* are repeated in both. Leaving for the present the discussion of the equation, Four lakhs of *Murāḍi tankās* = five hundred *Tumāns* of Irāq, I will proceed to quote another passage in which the *Murāḍi tankā* is again explicitly mentioned in the *Tabaqāt*. Speaking of the visit of Mirzā Rustam in the thirty-eighth Regnal year, Nizāmu-d-din says:—

چون بشرف ملازمت رسید انواع الطاف اشفاق و عفوئت بادشاهانه بظهور
آورده یک کروور تنگه مرادی انعام فرمودند و در سلک امرای پنجهزاری انتظام
داده ملتانرا بجایگیر مرزا لطف فرمودند *

Lucknow Lithograph, p. 379, ll. 16-18. Mullā Firūz Library
Manuscript, folio 379 A., ll. 7-10.

“When he had the honour of paying his respects, the Emperor showed him a variety of kindnesses and favours and princely condescensions, and presented him with a *kror* of *Murāḍi tankās*, and gave him a place among the Amirs who were Commanders of Five Thousand and bestowed Multān upon him as his Jāgir.”

Here again, Badāoni repeats the important epithet *Murāḍi*, which is omitted in the version of Dowson (E. D. v, 467), leaving no doubt that it must have existed in the copy of the *Tabaqāt* which Badāoni had before his eyes while compiling his own account. Badāoni's own words are as follows:—

و بعد از ملازمت مبلغ یک کروور تنگه مرادی نقد انعام بخشیده در سلک
امرای پنجهزاری داخل ساخته بجایگیر او ملتان نامزد گردانیدند *

Bibl. Ind. Text, II, 388, ll. 20-22. Lucknow Lithograph 271,
ll. 6-7.

“After he had paid his respects, [the Emperor] made him a present of the sum of *one kror Murāḍi tankās in cash*, and gave him admission to the rank of those Amirs who were Commanders of Five Thousand and appointed Multān as his Jāgir.”

In this passage, Lowe has rendered the word *Murāḍi*, which stands out clearly in the text which he took as the basis of his translation, by ‘in small change.’ (II, 402).

I have noted another passage which occurs only in Badāoni and relates to his personal experiences. He informs us that he had been commanded to translate into Persian a collection

of Hindu Tales entitled by him *Baḥru-l-Asmār*—"Ocean of Stories"—[*Kathā Sarit Sāgara*?], and that when he laid his version at the feet of his Imperial patron, Akbar was highly pleased, and ordered him to correct and modernise an older rendering of the first part also, which had been made in the time of Sultān Zain-al-'Ābidin of Kashmir.

و شروع در آن کردم و بعد از التفات بسیار ده هزار تکه مرادی انعام و

اسپ بخشیدند *

Bibl. Ind. Text, II, 402, ll. 5-6. Lucknow Lithograph, 276,
ll. 1-2.

"I began it and after [giving me] many marks of favour, he gave me a present of ten thousand *Murādi tankās*, and a horse."

Here again Lowe has rendered the word *Murādi* by "in small change." (II, 416).

Let me now sum up the results of this inquiry. Not reckoning the passage cited by Thomas, *which was hitherto the only one known*, there are at least *three* other passages in each of these authors, in which the *Murādi tankā* is explicitly mentioned. Two of these passages are found in both, Nizāmu-d-din and Badāoni, and relate to the 32nd and the 38th Regnal years. But each has one passage to which there is no parallel in the other. That which is earliest in point of time occurs only in the *Tabaqāt* (R.Y. XXV). That which is latest in point of time is found only in the *Muntakhab* (R.Y. XL) of Badāoni.

We may take it then that these passages indicate that a *tankā* which bore, for some reason, the peculiar designation of *Tankā-i-Murādi*, was current in Akbar's reign from the twenty-fifth to the fortieth year. It does not appear to have been merely a money of account; for Badāoni explicitly uses the words "One crore *Murādi tankās* (*Naqd*), i.e. in cash," and says that he himself received ten thousand of them from the hands of the Emperor. Here it may be useful to quote the note of Lowe's on the expression which he has rendered by the phrase, "in small change." "It was the custom to keep bags of 1000 *dām* at hand ready for distribution" (II, 402, n. 8) and he quotes as his authority, Thomas's *Chronicles*, p. 421, n. 1, where we read: "Abul Fazl relates that a *kror* of *dāms* was kept ready for gifts within the palace, 'every thousand of which was kept in bags.' Bernier mentions the continuation, even to Aurangzeb's time, of the same custom of having bags of 1,000 *dāms* ready for distribution." (*Chronicles*, p. 421, n. 2).

The language of Nizāmud-din also scarcely supports, if it does not actually militate against, the supposition that the *Murādi tankā* was merely a money of account. He tells us that

Nazar Bey actually received 24,000 of these *Murādi tankās*, along with 100 ashrafi and 1,500 rupees, neither of which last could possibly come under that description. It is more likely that the Emperor, for some reason connected with the court etiquette relating to the entertainment of envoys and other visitors from foreign parts, furnished him with a reasonable quantity of the currency of the realm, in all the three metals.¹ The total amount of the gift would be about 3,700 rupees taking the ashrafi at 10 rupees, and the *Murādi tankā* at $\frac{1}{20}$ of a rupee. If the object had been merely to give the ambassador a certain sum as *douceur*, or if the *Murādi tankā* had been merely an accountant's fiction, he would have given him only 370 ashrafis, or only 3,700 rupees. It seems that a few of those bags filled with coppers, which "were kept ready for distribution," were included in the Imperial gift, with the object of obviating any difficulties which the stranger might possibly experience in the exchange transactions incidental to everyday existence, which appear to have been conducted for the most part in copper in those times. It is perhaps permissible also to conjecture that these *Murādi tankās* were specially included on this occasion, because they had been then but recently coined and placed in circulation.

But supposing the *Murādi tankā* was a money of account only, what was its value? For this we have the equation—Four lakhs of *Tankā-i-Murādi* = five hundred *Tumāns* of *Irāq*. But what was the value of the *Tumān* of *Irāq*? Abul Fazl is explicit on that point:—"The *Tumān* of *Khurāsān*," he says, "is equal in value to 30 rupees, and the *Tumān* of *Irāq* to 40." (*Ain-i-Akbarī*, Tr. Jarrett, II, 394). But if 40 rupees are equal to one *Tumān* of *Irāq*, and if four lakhs of *Murādi tankās* are equal to five hundred *Tumāns* of *Irāq*, it follows that

¹ It appears to have been the practice to present to ambassadors and distinguished visitors from foreign parts on their arrival or departure, or both, various sums of money for, as it is often expressly said, their expenses. Thus, Jahāngir gave the envoy of the Sharif of Mekka five lacs of *Dāms* in the second year of his reign (*Tāzūk*, Tr. Rogers and Beveridge, I. 133). In the tenth year, he bestowed twenty-thousand *Darbs* (half-rupees) on Mustafā Beg, the Persian ambassador. (*Ibid.*, I. 284). Muhammad Rizā, another envoy of the ruler of Irān, received in the twelfth year sixty thousand *Darbs*. (*Ib.*, I. 374). The *Wakils* of 'Adil Khān of Bijapūr and Qutb-ul-Mulk of Gulkandah also are stated to have received donations of one lac and of sixty-thousand *Darbs* respectively soon afterwards in the same year. (*Ibid.*, I. 433 and 439). Several other examples of the same practice occur elsewhere in the same work (I. 206, 296; II. 36, 75, 90, 94, 97, 165, 236). It would be easy to quote additional passages from the *Bādshāh-nāmah* and the histories of Aurangzeb, but it is scarcely necessary to do so. A study of all the passages seems to show that whereas Akbar's presents were generally made in these *Tankā-i-Murādi*, Jahāngir preferred to give *Darbs*, and Shāh Jahān and Aurangzeb Rupees.

800 *Murādi tankās* = one Tumān of 'Iraq = 40 Rupees (Akbari), and that

20 *Murādi tankās* = one rupee (Akbari).

In other words, 1 *Murādi tankā* = 2 *dāms*, taking the *dām* at $\frac{1}{10}$ of the Akbari rupee. Of course, all this depends upon the correctness of Abul Fazl's equation—1 *Tumān* of 'Irāq = 40 Rupees; and it is possible to argue that Nizāmud-din's *Tumān* of 'Irāq may not have been at all identical with that of Abul Fazl, and may have been worth less or more. Fortunately, however, it is possible to show decisively that it was worth neither more or less than 40 rupees. Nizāmu-d-din himself gives the identical equation in an indirect manner, in not one but two passages, which I shall content myself with quoting from Dowson's translation:

"The debts of Shaikh Mohammed Bukhāri, who was killed at the battle of Pattan, and of Saif Khān Kokā, who fell in the second campaign of Ahmadābād, were ordered to be paid out of the public treasury. The total amounted to *one lac of Akbarshāhi rupees, equal to two thousand five hundred Tumāns of 'Iraq.*" (E.D. V. 370-1). It is obvious from this that 40 *Akbarshāhi rupees* = 1 *Tumān of 'Irāq*. Elsewhere he says:

"*Nearly* a lac and a half of rupees, equal to three thousand seven hundred *Tumāns of 'Iraq*, goods of Hindustan and curiosities, were entrusted to Muḥammad 'Alī Khazānchi for presentation to 'Abdullāh Khān." (E.D. V. 455).

Now, 3,700 *Tumāns of 'Irāq* at 40 rupees to the *Tumān* would be equal to only 1,48,000 rupees, and it is thus easy to see why the scrupulously exact quarter-master-general and accountant qualifies the expression, "a lac and a half of rupees" with the adverb "*nearly*" (*Qarīb-i-yak-nim lak rupiyah*). Lucknow Lithograph, p. 371, l. 9.¹

¹ It is perhaps not unnecessary to add that we have nothing to do here with the various estimates of the value of the *Tumān* in European money which are to be found in the works of English, French and Italian travellers of the seventeenth century. What we are concerned with is not, what any one of them understood by the word, but what the author of the *Tabaqāt* believed the "*Tumān of 'Irāq*" to be valued at. Nizāmud-din's own declaration on that head must therefore be *absolutely decisive*, even if we did not possess the exceedingly valuable corroborative testimony of his contemporary Abul Fazl. The *Tumān* appears to have been at this time merely a money of account and to have varied also from place to place (Qandahār, Khurāsān, Irāq, etc.). It seems also, like several other denominations of money, to have run an almost uninterrupted course of depreciation with the lapse of time. Pietro della Valle's (1619 A.C.) estimate makes it equivalent to £4 10s. (*Travels*, II. 22). Mandelslo says it was equal to 5 Pistoles, i.e. about £4 3s. 9d. Tavernier in his *Persian Travels* (ed. 1676, p. 122) takes it to be = 15 écus, which at 4s. 6d. the écu = £3 7s. 6d. Elsewhere he declares it was equal to 50 Abāsis, i.e. about £3 15s. (Ball's edition, I. 24). Sir Thomas Herbert says the 'Toman is five marks sterlin' (*Travels*, p. 225), which, at 13s. 4d. the mark, would be = £3 6s. 8d. Fryer (1677 A.C.) estimates "every Tho-

So far then, it appears that the passage quoted at the head of this paper is not, as has been hitherto supposed, the only reference to the *Murādi tankā* in Indian Historical Literature, and that a copper coin or *tankā* of which the value was equal to the double *dām* is referred to at least six times by Badāoni and Nizāmu-d-din. But it is not only in these two historians that this *tankā* finds mention. I have traced an explicit allusion to it in the *Mirāt-i-Sikandari*, a history of the Gujarāt Sultāns finished about 1611 A.C.—about six years only after Akbar's death—by Sikandar bin Manjhū, who appears to have himself entered the Imperial service, after the conquest of the province by Akbar's arms. This writer appears to have been perfectly familiar with this denomination of currency, for in the course of his account of an invasion of the territories of the Rānā Kombhā of Chitor by Qutbu-d-din Ahmad Shāh II, of Gujarāt, in 861 A.H., he remarks: "It is said that the battle lasted for five days, and that a cup of water was sold for five *phadiyāhs*, equivalent in that neighbourhood to twelve *Murādi tankās*." (Bayley, *History of Gujarāt*, p. 151. See also Fāẓal Lutfullāh's Translation, p. 35).

It is evident that the *Phadiyāh* had become obsolete in the writer's day, and so, to bring home to his readers the extraordinary scarcity of water in that arid region, he has taken care to give the equivalent of the *Phadiyāh* in a denomination of money familiar to his contemporaries. Unfortunately, the explanation conveys to us but little illumination, and a cloud now hangs over the *Murādi tankā* which is, if possible, thicker and darker than that which surrounds the *Phadiyāh* or *Fedeā*, of which Yule and Burnell say :

"Fedeā, Fuddeā. A denomination of money formerly current in Bombay and the adjoining coast; Mahr[āttī], *p'hadyāh* (qu. Ar. *Fidya*, ransom?). It constantly occurs in the account statements of the 16th century, e.g. of Nunez, (1554) as a money of account of which 4 went to the silver tanga, [see TANGA], 20 to the Pardao. * * * Prof. Robertson Smith suggests that this may be the Ar[abic] denomination of a small coin used in Egypt, *fadda* (i.e. 'silverling'). * * * But, according to Lane, the name was originally given to half-dirhems, coined early in the fifteenth century, and these would be worth about 5½*d*. The *fedeā* of 1554 would be about 4½*d*. This rather indicates the identity of the names." (Hobson-Jobson, ed. Crooke, s.v. Fedeā).

Now, taking Nunez's value for the *Phadiyāh*, or rather, Yule's estimate of it, and regarding the rupee of Akbar (of full

mand" at "three pounds and a noble," i.e. £3 6s. 8*d*. (*Travels*, p. 222). According to Kelly's Universal Cambist, it represented a value of only £1 16s. in 1821 A.C., and at the present day it is said to be worth only 7s. 6*d*. Vide Yule and Burnell, Hobson Jobson, s.v. Toman and Ball's Tavernier I. 415, from which this note is compiled.

weight), as equivalent to 2s. 6d. (Lane Poole's *Aurangzib*, p. 120, and the authorities quoted there), we have :—

$$12 \text{ Murādi Tankās} = 5 \text{ Fadiyāhs} = d, 4\frac{1}{4} \times 5 = \frac{17}{4} \times 5d. = \frac{85}{4} d.$$

$$= \frac{85}{4} \times \frac{1}{30} \text{ Rs.} = \frac{85}{120} \text{ Rs.} = \frac{17}{24} \text{ Rs.} = \frac{17}{24} \times \frac{10}{1} \text{ Dāms} \\ = \frac{85}{12} \text{ Dāms} = 28\frac{1}{3} \text{ Dāms.}$$

$$1 \text{ Murādi Tankā} = \frac{85}{120} \text{ Dāms} \times \frac{1}{12} \text{ Dāms} = \frac{85}{1440} \text{ Dāms} \\ = 2\frac{1}{36} \text{ Dāms.}$$

The result will be even closer if we take the *Phadiyāh* to be equal to 4d. instead of $4\frac{1}{4}d$. It will be then $2\frac{2}{9}$ Dāms.

But there is yet another gauge that is available. About twenty years ago, I discovered in the possession of an old Pārsi priest of Navsāri, near Surat, a bundle of original Persian and Gujarāti documents, of the sixteenth and seventeenth centuries, illustrating the history of our small community. One of these is a Persian sale-deed of 923 A.H. (1517 A.C.), by which thirty-two bighās of land were sold to a famous Pārsi of those times, Mānak Chāngā, by Musammat 'Īsmat Khātūn for the sum of the five hundred Phadiyās, each *Phadiyāh* of which was to be of the value of 12 *Dokdās*. Now, the *Dokdā* of Gujarāt is almost everywhere defined as the $\frac{1}{100}$ part of a rupee (Wilson's *Glossary*, s.v.; *Belsāre, Gujarāti-English Dictionary*, s.v.), and is most probably, what the author of the *Mirāt-i-Ahmadi* calls the *tankchāh* of Gujarāt, of which also 100 went to the rupee. (Bayley, *Gujarāt*, p. 6). Now, if a *Phadiyā* was equivalent to 12 of these *Dokdās* and if 5 *Phadiyāhs* were equal to 12 *Murādi tankās*, it is obvious that 12 *Murādi tankās* = 60 *Dokdās* = $\frac{3}{5}$ of a rupee = $\frac{3}{5} \times \frac{10}{1} \text{ Dāms} = 24 \text{ Dāms}$:

$$\therefore 1 \text{ Murādi tankā} = 2 \text{ Dāms.}$$

This extraordinary confirmation of the value given for the *Murādi tankā* by Nizāmu-d-din, from a chance document found in a Pārsi house in an obscure corner of Gujarāt, is, to say the least of it, extraordinary, and deserves careful consideration at the hands of any one disposed to scout the theory enunciated by Thomas.

But this does not exhaust the evidence. It is possible to demonstrate the existence of a *tankā* equivalent to two *Dāms*, and to adduce at least two conclusive examples of the equation from the *Āin-i-Akbari* itself. In a chapter on the "Profit of the Dealers in Gold and Silver," which deserves to be carefully studied by every advanced student of Mughal Numismatics, Abul-Fazl says :

"The merchant buys for 100 *L'al-i-Jalālī* Muhrs 130 *T[olāhs]* 2 *M[āshās]* 0½ *S[urkhs]* of *Hūn* gold of 8½ *bāns*.¹ Of this quan-

¹ The Mughal phrase for gold of absolute fineness—24 carats or 100 touch—was *Bārahbāni*—i.e. of twelve *Bāns*. Abul Fazl writes:

"The highest degree of purity is called in Persia *Dahdahī* [i.e. ten in

tity, 22*l.* 9*m.* 7½*s.* burn away in melting, and mix with the *Khāk-i-khalāc*, so that 107*l.* 4*m.* 1½*s.* of pure gold remain which are coined into 105 muhrs, leaving a remainder of nearly half a *tolāh* of gold, the value of which is 4 rupees. From the *Khāk-i-khalāc*, are recovered 2*l.* 11*m.* 4*s.* of gold and 11*l.* 11*m.* 4½*s.* of silver, the value of both of which is 35 rupees, 12½ *tangāhs*, so that altogether, the above-mentioned quantity of gold yields 105 Muhrs, 39 Rs, and 25 dams. (*Āin-i-Akbari*, Tr. Blochmann, I, 37).

It is easy to see that this total of 39 rupees, 25 Dāms is made up by adding the 4 rupees which are stated to be the market-price of the residuary half-tolāh of gold and the 35 Rs. 12½ Tangāhs which represent the aggregate money-value of the gold and silver bullion recovered from the *Khāk-i-khalāc*. In other words.

$$(4 \text{ Rs.}) + (35 \text{ Rs.} + 12\frac{1}{2} \text{ Tangāhs})$$

$$= 39 \text{ Rs.} + 25 \text{ Dāms, i.e. } 12\frac{1}{2} \text{ Tangāhs} = 25 \text{ Dāms.}$$

$$\therefore 1 \text{ Tangāh} = 2 \text{ Dāms.}$$

Then again, in Abul-Fazl's account of the Subah of Berār, we read :

"This Subah contains 16 *Sarkārs* and 142 *Perganahs*. From an early period, the revenues were taken by a valuation of crops and since the *Tankāh* of this country is equal to 8 of Dehli, the gross revenue was 3½ kror of *Tankāhs* or 56 kror of *Dāms*."

Āin-i-Akbari, Tr. Jarrett, II. 231.

Now if 3½ kror of Berāri *tankās* = 56 kror of *dāms*,

1 Berari *tankā* = 16 *dāms*.

And we are also told that

1 Berāri *tankā* = 8 *tankās* of Dehli.

But we have seen that

1 Berāri *tankā* = 16 *dāms*.

∴ 8 *Tankās* of Dehli = 16 *dāms*.

∴ 1 *Tankā* of Dehli = 2 *dāms*.

All the above passages are from contemporary writers. Nizāmu-d-din Ahmad, Badāoni, and the author of the *Mirāt-i-Sikandarī* all speak of a *tankā* called *Murādi* which was clearly equal to the one-twentieth part of a rupee or two *dāms*. Abul Fazl also twice speaks of a *tangāh* or a "*tankah of Dehli*" which was equal to two *dāms*. Let me now quote two referen-

ten]: but they do not know above *ten* degrees of fineness ; whilst in India, it is called *Bārahbāni*, as they have twelve degrees. Formerly, the old *Hun* which is a gold coin current in the Deccan, was thought to be pure, and reckoned at ten degrees, but His Majesty has now fixed it at 8½, and the round small gold *Dinār* of 'Alāuddin which was considered to be 12 degrees now turns out to be 10½." (*Āin-i-Akbari*, Tr. Blochmann, I, p. 18.)

ces to this *Tankā-i-Murādi*, which occur in later, but by no means contemptible, authorities. One of them occurs in the *Mirāt-i-Ahmadi*, the other in the *Ma,āsir-ul-Umarā*. The first shows that the phrase *Murādi Tankā* was used in official documents and supposed to require no explanation so late at least as the time of Aurangzeb, while the second proves that the author of the *Ma,āsir* was not unacquainted with the equation of which we have already had so many illustrations.

1 (*Murādi*) *Tankāh* = $\frac{1}{20}$ of an Akbari rupee, i.e. 2 dāms.

Let me first quote the *Mirāt-i-Ahmadi* :—

و در سال هزار و نود و چهار بموجب التماس ناظم صوبه بجهت محبوسان
و فوئیان جمعی از مسلمین که ورثه غنی نداشته باشند حکم [شد] که فی
نفر از محبوسان چدوترو کتوالی یک آثار آرد گندم و برای فوتی فی نفر
دو چادر و پنج تنگه مرادی از خزانه بیت المال میداده باشند *

Mirāt-i-Ahmadi, Bombay Lithograph, 1307 A.H., Part I,
p. 322, ll. 5-8.

“And in the year one thousand and ninety-four [A.H.], it was ordered, in accordance with the request submitted [respectfully made] by the Administrator (ناظم) of the Subah (or Province of Gujarāt), on behalf of those prisoners and deceased persons, who belonged to the Musalmān community and had no well-to-do relatives (*lit.* heirs), that every such prisoner [kept] in the guard-house of the Kotwāl should have, per head, one seer of wheat flour, and every individual defunct should have two sheets (or shrouds) and five *Murādi tankās* given [for burial expenses] from the Public Treasury.”

This author, it will be seen, clearly mentions the *Murādi tankā*. We may think it unfortunate that he has not cared to explain what a *Murādi tankā* was equal to in his day, but the omission is probably due to the fact that the phrase was so well understood when he wrote, as to require no gloss or commentary. It is clear, however, from the passage I have quoted in the Note on the ‘Weight of Aurangzeb’s Dāms,’ from another part of his work (Part I, p. 282, ll. 10-11), that the *Tankā* was valued in Gujrat at two *Falūs*, i.e. *Dāms*, before 1077 A.H.

My second quotation is from the *Ma,āsir-ul-Umarā*, a very valuable Biographical Dictionary of the celebrated persons who flourished in this country under the House of Timur. In the Life of Qāsim Khān, *Mir-i-Bahr*, under whose supervision the great Fort of Āgrā was completed in 972 A.H. (1564-5 A.C.), the writer says:

و قلعه رفعت اساسی آگره که بوسانت و صقانت عدیل و نظورش مساحان
ربع مسکون نشان نداده اند بحسن اتمام قاسم خان در عرض هشت سال
صرف هفت کروڑ تکه که سی و پنج لک روپیہ باشد صورت اتمام و نقش
اختتام گرفته *

Ma,āsir-ul-Umarā, Bibl. Indica Text, Vol. III, p. 63, ll. 6-10.

“ And the elevated Fortress of Āgrā, the like and equal of which in strength and solidity has not been described (*lit.* pointed out) by those who have travelled in the quarters of the inhabited [world], was completed and received the finishing touch in the space of eight years, at a cost of seven crores of *tankās* which are equivalent to thirty-five lakhs of rupees, [thanks] to the excellence of Qāsim Khān’s management.”

It is scarcely necessary to say that if

Seven crores of *tankās* = thirty-five lakhs of rupees,

20 *Tankās* = one rupee,

1 *Tankā* = $\frac{1}{20}$ of a rupee or 2 *dāms*.

One more documentary proof of the value borne by the *Tankā* has been recently discovered in distant Kashmir, which shows that the *Tankā* equal to the twentieth part of a Rupee was in general use, and that the name also was familiar to the people, so late as 1093 A.H. (1682 A.C.). In a manuscript of a portion of the *Mahābhārata*, purchased by Dr. M. A. Stein at Srinagar in October 1898, “ a curious deed of sale ” is endorsed on the obverse leaf of the ‘ *Ashvamedha Parvan*. ’ The agreement is written out in Sanscrit as well as in Persian, and it is recorded in the former that the MS. was sold to the worshipful Guru Ānanda for *forty-five thousand Dinnāras*. It is stated with equal clearness in the latter, that the sale took place on the 1st of Ramazān 1093 A.H., and that the price was two hundred and twenty-five *Tankās*.

Now Dr. Stein has proved that “ the Kashmirian *Hath*, Sans. *Sata*, i.e. the hundreder (the hundred-dinnāra piece), was, in Akbar’s time, as clearly shown by a statement of Abul Fazl, only equal to $\frac{1}{20}$ of a Rupee. The *Sāsūn* or thousander, the old *Sahasra*, accordingly, then represented a value of not more than $\frac{1}{4}$ of a Rupee.” The forty-five thousand *Dinnāras* of the document would, at this rate, have been equal to $11\frac{1}{4}$ Rupees. So far, every thing was clear to Dr. Stein (*J.R.A.S.*, April 1900, pp. 187-194, and *Numismatic Chronicle*, 1899, Vol. XIX, pp. 125-174), but he was unable to say, “ what particular coin ” was meant by the ‘ *Tankā*, ’ though he thought that “ a copper coin was evidently intended.” It is perhaps scarcely necessary to say that the coin was the *Tankā* which is the subject of this article, i.e. the *Tankā* = $\frac{1}{20}$ of a Rupee. It is clear that if

$$\begin{aligned}
 225 \text{ Tankās} &= 45,000 \text{ Dinnāras,} \\
 &= 11\frac{1}{4} \text{ Rupees,} \\
 1 \text{ Tankā} &= 200 \text{ Dinnāras.} \\
 \text{But } 100 \text{ Dinnāras} &= \frac{1}{10} \text{ Rupee,} \\
 \therefore 1 \text{ Tankā} &= \frac{1}{10} \times \frac{2}{1} = \frac{2}{10} \text{ Rupee.}
 \end{aligned}$$

So far we are on solid ground. All the passages quoted are clear enough and there is not room for much difference of opinion as to their meaning. But there are several other points in this connection which are not easy of solution and to these I must now advert.

We have seen that Abul Fazl calls this full tankā (equal to two Dāms or the $\frac{1}{20}$ th part of a rupee) the "*Tankā-i-Dehli*." Nizāmu-d-din and Badāoni give it the designation of "*Tankā-i-Murādi*." I confess that I cannot give any particular reason for either appellation. Why call it the "*Tankā* of Dehli" only, and not of Āgrā, Lāhore, or any other place where it was current? And for the matter of that, why call it '*Murādi*'? I am afraid it is scarcely possible to say anything really useful on that head, and we are left to mere conjecture. It is possible that the epithet had something to do with the name of the Prince Murād, and that the full tankā came, at some time in its history, to be called after Akbar's favourite son. It is of course open to any one to hold that it is nothing more than one of those meaningless expletives or 'coefficients' as they have been called, of which there are so many in Persian and Hindustāni idiom, e.g. *Panj* (five) *Zanjir-i-fīl*, *Qabzah-i-Shamshir*, *Dānah-i-Marwārid*, *Muhāri-Shutur*, *Qata'a-i-La'al*, *Najaf-i-Bargandāz*, *Fard-i-Kāghaz* or *Dast-i-Bāz*. These and many another "gem of the Munshi's repertory" may be seen in Carnegie's *Kāchāri Technicalities*, or in Yule and Burnell's *Hobson-Jobson* (s.v. Numerical Affixes, ed. Crooke, p. 634). But neither of these suppositions is supported by any positive evidence, and our knowledge of the many fanciful and often far-fetched innovations in nomenclature for which Akbar appears to have had an unreasoning partiality, should warn us against making any confident statement on that head. Indeed, it seems to me that the *origin* of the phrase is a mere side-issue upon which it is scarcely necessary to lay stress in the present state of the inquiry. Etymological inquiries are of practical value only when there is a doubt as to the *real meaning* of a word or phrase. They are scarcely anything more than curiosities when the meaning stands out clearly, as it does in this case, from the words of the writers themselves. It is possible that scholars will long continue to differ about the derivation of the word *Murādi*, but then how many of us are agreed as to the etymology of *Tankā* itself, or *Dām* or *Paisā* or *Dokdā* or *Kāni* (or *Gāni*)?

I submit, therefore, that our ignorance of the *origin* of the

epithet ought not to be permitted to obscure the real point at issue. That point is simply this, was there a *tankā* called, for some reason unknown, *Murādi*, and was it equivalent to the twentieth part of a rupee as the *dām* was equal to the fortieth? That question, I venture to state, *admits now of but one answer*, and that is in the affirmative, and should be enough for our purpose.

Another question, 'Was the *Tankā-i-Murādi* a mere money of account?' is perhaps more difficult to answer, and I am afraid that it is impossible for any one conversant with the evidence at present available, to say with any confidence that it was not. I have urged such considerations as have suggested themselves in favour of the opposite view, but I am by no means oblivious of the difficulties in the way. Nizāmu-d-din as well as Badāoni speak of so many as one crore of these *Murādi tankās* having been given as a present to Mirzā Rustam. It is not at all easy to understand why the Emperor should not have given him five lakhs of rupees or about fifty thousand muhrs, which would have been identical in value, and at the same time more convenient, probably to him who paid, and certainly to him who received them. It is true that Abul Fazl as well as Bernier speak of the custom of keeping "bags of 1,000 *dāms* at hand for distribution," but a crore of *tankās* would have required ten thousand bags to contain and about eight hundred carts to carry them. This is of course unthinkable, and we are naturally inclined to suppose that the *Murādi tankā* could not have been anything else than an accountant's fiction, and that there was no coin corresponding to it in reality. I fear, however, that this is pressing the conclusion too far. The Mughal historians frequently assert that this or that Emperor presented one crore, two crores or three crores of *dāms* to this or that prince or noble. Several instances can be quoted from the *Tūzūk-i-Jahāngiri* and the *Ma,āsir-i-Ālamgiri*.¹ Are we therefore to infer that the *dām* also was a mere "money of account," and that it was only an imaginary unit invented by some financier for the convenience of his subordinates, and retained for the purpose of producing, by the magnitude of the figures, an unreal impression of the Imperial

¹ An *in'ām* of one crore of *Dāms* was given to the Khān-i-Khānān Mir Jumla in 1072 A.H. for his conquest of Āssām (*Ma,āsir-i-Ālamgiri*, p. 40; Khafi Khān, II, pp. 154-5). One crore *Dāms* were also presented to the Wazir Ja'āfar Khān in 1080 A.H. (*Ma,āsir*, 90). The Prince Muḥammad Mu'azzam had a gift of three crores in 1083 A.H. (*Ibid.* 123). Other examples of donations, varying from five lacs of *dāms* to two crores, are found on pp. 142, 149, 150, 236, 274, 282, 365, 441, 470, 474, 481, 494, 506, 516 of the same work. Earlier instances of the reign of Jahāngir occur in the *Tūzūk-i-Jahāngiri*, Tr. Rogers and Beveridge I. 46 (one lac); I. 72 (twenty lacs); I. 75 (thirty lacs); I. 133 (five lacs). Khāfi Khān records three cases in the reign of Shah Jahān: I. 581 (two crores), I. 601 (two crores), and I. 755 (five crores) to Dārā Shikoh.

resources and munificence? The specimens in our museums of Akbar's *falūs* or *dāms* are sufficiently numerous to demonstrate the fallacy of this supposition, but then when Aurangzeb made to the Prince Muhammad Muazzam a present of three crores of *dāms*, are we to understand that several thousand carts loaded with copper coins were sent to the Prince's residence? Most probably not. The amount of the gift was *estimated* in *dāms*, but the *dām* was an actual coin and *not* a mere "money of account," in our sense of the term. The entire Mughal revenue was estimated in *dāms*, and all the accounts were kept in *dāms*, but the *dām* was an actual coin and a "money of account" only in the sense that it was the commonest fiscal unit in which all *accounts* were kept. It would appear as if the *Murādi tankā* which we have seen mentioned in connection with the amounts of large money-gifts was, just like the *dām*, a real coin as well as a fiscal unit, and not a mere "money of account" in our sense of the term.

But supposing that it was a "money of account" and nothing more, it does not at all affect the conclusion so far as the *primary question as to the real meaning of the 'Return' of Nizāmu-d-din Ahmad*, quoted at the head of this article, is concerned. 'Money of account' or not, it is clear that 640 crores of *Murādi tankās* were equivalent to 32 crores of Akbari rupees, and not to 16 crores, and that *Thomas was after all right in the surmise* which Mr. Lane-Poole rejected as scarcely worthy of serious consideration. So far the demonstration is complete. Whether the 32 crores of rupees represent *merely the land revenue* or *the sum total of the Imperial income* from all sources is another matter, which may be discussed more fitly in some other place.

One word more as to the strictly numismatic aspect of the question. If the *Murādi tankā* was valued at two *Dāms*, and equivalent to $\frac{1}{20}$ th of a rupee, what is its relation to the *Tankā-i-Akbarshāhi*, of about double the weight of the *dām*, of which several specimens have been unearthed since Thomas wrote? The difficulty is that the earliest dated *tankā* is not older than the 44th Regnal year (Whitehead, P.M.C. No. 615), though *half-tankās* of the 40th, 41st, 42nd years have been found. Nizāmu-d-din first mentions the large *tankā*, equivalent to the twentieth part of a rupee, in connection with the 25th Regnal year, while Badāoni's earliest reference is to the 32nd, and even Abul Fazl's is probably not later than the 40th year of the Reign. Indeed, Nizāmu-d-din died in the 38th year, and Badāoni, whose history does not go beyond the 40th, is generally believed to have died soon afterwards. Abul Fazl, it is true, lived up to the 46th year, but the facts and figures in the *Ain* are in more than one instance said expressly to refer to the 39th or the 40th year.

We are therefore led to suppose that the full *tankā* of about

640 grs. must have been first coined much earlier than is believed, at present. It would be hazardous, however, to say more in the present state of our ignorance than that Numismatists would do well to be on the look-out for specimens of earlier dates.

S. H. HODIVĀLĀ.

Junagadh.

Note.—The Akbari *dām* is the legitimate successor of the Sūri *dām*. Sher Shāh Sūri was the first ruler to strike copper coins of this size and weight. Is it known from the original authorities what these Sūri coins were designated? We numismatists take it that they were called *dāms*. Halves, quarters, and smaller fractions of the Sūri *dām* are known, but not a single Sūri double *dām* has been found up to date. Mr. H. Nelson Wright, I.C.S., has a heavy *dām* of Islām Shāh Sūri (see Numismatic Supplement to the Journal of the Asiatic Society Bengal, XXV, p. 236) but it is not really a double *dām*. Its weight (460 grains) makes it equivalent to about a *dām* and a half. As Akbar continued the monetary system inaugurated by that very capable administrator Sher Shāh Sūri, numismatists call his ordinary copper issues *dāms*. As far as we know from the actual coins so far discovered, the word *tankā* did not come into use on the coinage till the fortieth year, and all *tankās* are dated in the *ilāhī* or Akbar's divine era. Ordinarily the half *tankā*, corresponding in weight and size with the *dām*, is found. But we also get the *chahāram hisṣa*, *hashtaham hisṣa*, and *shānadhām hisṣa*. The *tankā* itself, or full *tankā* as it is often called to distinguish it from the half *tankā* which is sometimes loosely designated *tankā*, is very rare—see N.S. XXV, p. 235. To return to the *dām* for a moment. The actual word *دام* is only found on one very rare issue from the Srinagar mint—see my new Punjab Museum Catalogue, Vol. II, pp. xcvi and 95. This piece, a *نیم دام*, shows that the *dām* and the half *tankā* were identical in weight and size.

Mr. Stanley Lane Poole is clearly in error when he says the terms *dām* and *tankā* are interchangeable. The coins themselves show that the *dām* was equivalent to the half *tankā*. As regards his dictum that there were undoubtedly double *dāms* as well as double *tankās*, I think I am right in saying that not a single double *dām* of Akbar has ever been discovered. By the double *tankā*, Mr. Stanley Lane Poole must have meant the full *tankā*. Such a thing as a two-*tankā* piece weighing as much as 1280 grains, is totally unknown. Probably at the time when he wrote the words now under discussion, the available coin material was small, and he confounded the half *tankā* with the *tankā*. One source of error is due to the fact that on some *tankā* issues, e.g. Aḥmadābād, Gobindpūr, the fractional

epithets are left out. The only double *dāms* known to me are the two specimens mentioned on p. 236 of N.S. XXV, one of Jahāngīr and the other of Shāh Jahān. Each I think is still unique.

It is curious that the almost invariable use of the word *tankā* by historians—Mr. Hodiwala gives instances of the seventh, tenth, fourteenth,regnal years—is not reflected on the coins themselves. Numismatists call by the name of *dāms* all the usual copper issues of Akbar of the appropriate dimensions which bear no denominational epithet, especially those which were struck before the *ilāhī* era came into use in Akbar's thirtieth year. They reserve the term *tankā* for those issues on which the epithet occurs, and these are unknown to coin collectors till Akbar's fortieth year. This is the date of a half *tankā* of Āgra mint in the Panjab Museum—Panjab Museum Catalogue, Vol. II, No. 614. The date of this very coin was read by Mr. C. J. Rodgers as forty-five—see Indian Antiquary, July 1890, Rare copper coins of Akbar, Fig. 36. I should be grateful if numismatists would communicate to me the dates of early specimens of the *tankā* issue. A numismatist would therefore expect to find the term *dām* used by historians when they refer to transactions which took place in Akbar's earlier years.

Mr. Hodiwala shows that Dowson and Lowe in their translations more than once omit the word *murādī* from what is in the original *murādī tankā*. Similarly the word *tankā* is omitted in one original, and the word *murādī* in another. So though the full form is *murādī tankā*, we also have the abbreviated epithets *murādī* and *tankā*. Unless we are to blame the copyists for incorrect and partial renderings, the inference seems to be that the word *murādī* is not indispensable, and that *murādī tankā* and *tankā* mean the same thing. This is the conclusion that Mr. Hodiwala finally arrives at from other considerations. I suggest that *murādī* is a redundant word which signifies that the *tankās* were copper money or currency. In support of this view I cite the fact that the word *murādī* is still used, though much more rarely than the usual epithet *muāzī*, to denote amounts of copper money less than one rupee in value. Thus *murādī āth āna chhe pai* can be used for *muāzī āth āna chhe pai*.

The further consideration arises,—Was the *tankā* merely a money of account like our guinea at the present day? Mr. Hodiwala deduces from the passages quoted by him that the *tankā* was current from the twenty-fifth to the fortieth year of Akbar's reign, and that it was not merely a money of account. The latter contention is supported by the facts that Badaoni mentions one crore of *tankās* in cash, and that this historian says that he himself received ten thousand of them from the hands of the emperor. Also one Nazar Beg actually received twenty-four thousand of these *tankās*, along with one hundred ashraḥīs, and fifteen hundred rupees. This event occurred in

the thirty-second year of Akbar's reign. But these considerations do not make the same appeal to the numismatist, though of course it is possible that the word *tankā* came into common use before it made its formal appearance on the coinage. In the first place, the *tankā* issue does not appear till the fortieth year. Mughal coins have been collected for the last century, and not a single specimen of Akbar's copper *tankā* issue is known to me prior to the fortieth year. Again, if this *tankā* was struck in such enormous numbers that ten millions of them could be gifted to one individual, while twenty-four thousand were presented to another person as ordinary coin of the realm, then *tankās* ought to be found in large numbers at the present day. This is true of the copper coin equivalent in weight and size to the *dām*, or half *tankā*. Every bazar in Northern India is full of *Sūrī* and Akbari *dāms*. But the full *tankā* is very scarce indeed. There is only one full *tankā* in the Indian Museum collection, and there are three in the Cabinet of the Lahore Museum. I myself during nine years of assiduous search in the Punjab bazars have found one specimen. So we are brought to one of two results. The word *tankā* was loosely used in old chronicles for the half *tankā* or *dām*. But Mr. Hodiwala has conclusively shown that the value of this very *tankā* as described by the historians was one-twentieth of a rupee, and that it was equivalent to the double *dām*. This equation also follows from numismatic considerations. So if the historians are referring to the full *tankā*, we are driven to the conclusion that this *tankā* was almost entirely a money of account, and that a few specimens were struck more as curiosities than as a circulating medium.¹

R. B. WHITEHEAD, I.C.S.

26-5-16.

182. FIRŪZGARH.

The obscure mint name Firūzgarh occurs for the first time in the short reign of Bahādur Shāh, Shāh 'Ālam I. Mr. Whitehead says that Firūzgarh was the name of a fort in the province of Bidar, west of Haidarābād (P.M.C., p. xci). His authority is not mentioned, but it was evidently Mr. Jadunāth Sarkār's *India of Aurangzeb* (p. xcv) or rather, the *Chahār Gulshan*, which includes Firozgarh or Ibrāhimgarh among the five forts of the province of Bidar, the other four being Bidar itself, Rāmgir, Kaliān and Muzaffarnagar or Balkhi (*ib.* p. 164). The *Chahār Gulshan* is not always an unerring guide, but in this case, it may be pronounced correct so far as it goes, because its statement is corroborated by a work of much higher authority. This is the *Ma'āsir-ul-Ūmarā*—a Biographical Diction-

¹ This discussion suggests the problem as to whether before the introduction of nickel pieces the anna was a coin or not.—H. N.

ary of the famous names of the entire Mughal period. In its account of Ghāzi-ud-din (Chin Qulich Khān), Bahādūr, Firūz Jang, it says:

و بعد از آنکه قاعه ابراهیم گده عرف ایکتر را که بقیروز گده موسوم شده
جبراً و قهراً گرفت *

Vol. II, p. 875, ll. 2-3 (Bibl. Ind. Text).

“And after [the fall of Bijāpur in the 28th Regnal year], he took by main force the fortress of Ibrāhimgadh *alias* Ikar variant, *Ankir* (انکیر), which was [thereafter] named Firozgadh.”

The same writer informs us in another place that this Ibrāhimgadh was, in his own time, called Āhangadh (*ib.*, II, p. 503, ll. 17-18; see also II, p. 746). Then again, we learn from the *Ma,āsir-i-‘Ālamgiri*, that this Chin Qulich Khān, Bahadur, Firūzjang, received on the 25th of Zil-hijjah, 1097 A.H., orders from the Emperor to march to the conquest of the fortress of Ibrāhimgadh, one of the dependencies (مضافات) of Haidarābād (*Bibl. Ind. Text*, p. 284, ll. 4-5). We are next told by the same writer that Firūzjang had performed the task and returned before the 24th of Rabi‘a I, 1098 (*ib.*, p. 288, ll. 8-13). We may take it then that the old name of Firūzgadh actually was Ibrāhimgadh. The fall of the fortress, which took place before that of the capital of the Qutb Shāhis, is mentioned with exultation by the author of the *Ma,āsir-i-‘Ālamgiri*, who declares that it “strengthened the foundations of the courage of the Ghāzis and uprooted the prosperity of the ill-fated enemy” (p. 288, ll. 12-13). It is therefore easy to understand why it received the punning name which signified that it was an omen of victory (فیروزى), and at the same time recalled the title by which the great Captain to whose arms it had succumbed was most familiarly known.

But where was this Ibrāhimgadh or Firūzgadh or Āhangadh? It is not easy to say, but the local Hindu name Aikar (variant انکیر *Ankir* or انکیر *Atkir*?)¹ indicates that it is the Yadgir (انگیر) of the Imperial Gazetteer Atlas—which is in the near neighbourhood of the four other forts mentioned in the *Chahār Gulshan*. Bhalki or Muzaffarnagar is about 25 m. N.-W. of Bidar (Elliot and Dowson, VII, p. 28 note) and about equidistant, in a northerly direction, from Kalyāni and Bidar. The latitudes and longitudes will clearly show this:—

¹ Etgeer (انگير) is mentioned frequently as a fortress of some strength in Ferishta’s annals of the Dekkan. Briggs, *Rise of the Mahomedan Power in India*. Calcutta Reprint III. 46, 126, 325, 326, 330; see also pp. 353, 361, 375, 376.

Yadgir	..	16°46' N. and 77°9' E.
Bidar	..	17°55' N. and 77°32' E.
Bhalki	..	18°3' N. and 77°12' E.
Kalyāni	..	17°53' N. and 76°57' E.

Yadgir is now in Gulbarga district, Haidarābād state, and possesses a fort built by an old Yādava king. Imperial Gazetteer XXIV, p. 400. In the statement of Marāṭha Revenues appended to Scott Waring's *History of the Marāṭhās*, the Sircar of *Firozgarh* or *Yadgeer* is the second of the seven Sarcārs of the Subah of Moohumudabad or Bidur (pp. 249, 251). The other Sircars are Havely (*i.e.* Bidur itself), Nanderee, Akulkote, Kalian, Ramgeeree and Moozufurnugur. The statement is said to have been "made out from Maratta records shortly after the campaign of my Lord Cornwallis," and may be taken to be decisive testimony of the identity of "Firuzgarh" and "Yadgir."

Junagadh.

S. H. HODIVĀLĀ.

183. "A SILVER DIRHAM OF BASTHAM."

May I be permitted to make a few additions and corrections in the descriptions of the silver coin of Bistām, and the history of this rebel, published in the Numismatic Supplement No. XXVI, article No. 154, under the heading of "A Silver Dirham of Bastham (Vastham) Sassanian Ruler in Khorasan in Persia" by Mr. Thanawalla.

The silver coins of the Sāssānians and those issued by the Arab governors of Persia after the Sāssānian type can only be described correctly by the name of drachme, while those of the Arabs bearing a Kufic legend are properly called dirhams.

Bistām did not belong to the house of Sāsān and therefore he cannot strictly be styled a Sāssānian.

The true name of Kobād II (25th February 628 to September 628) is Shērōe (diminutive of Shēr, "lion"), *Σηρόης*, *Σειρόης* and *Σηρόης* among the Byzantines, Syriac Shiroī and Armenian Sheroī (Noeldeke, Tabari, p. 361, and Justi, *Iranisches Namenbuch*, p. 297). Masudi speaks of him as Qobād Shīrūyah el-ghashūm. On mounting the throne he took the name of Kobād, which we find on his coins with the epithet *firōch* as *Firōchī Kavātū*, "Kobād the victorious."

The epithet *kadī* or *gadī* is adopted first by Yezdegerd II (438-457) on his coins, then by Firōz I (459-484) and again by Kobād I (488-497 and 499—13th September 531). We find it also on the obverse of the coins of Shāpūr III (383-388).

Bartholomaei and Dorn (*Mélanges asiatiques*, 1858, p. 335) find that the word is derived from the Semitic *gad*, "felicity," whence *gadī*, "fortunate"; the meaning of the word therefore being "the fortunate" and not the "King" as is translated. The pronunciation too should be *gadī* rather than *kadī*. This

word has of course no connection with the Arabic *qādhi*, "Muselman magistrate," which is written *cadī*. The literal translation of *Gādī* or *Kadī Firōz* is "the fortunate, victorious," but here it means "Firōz the fortunate" and not *King Firoz*.

On a gold coin in the Hermitage Museum, described by Drouin (*Bulletin numismatique*, vol. II, 1893, p. 61 sq.), we find on the obverse the legend *Kavātī Kadī*, "Kobād the fortunate."

On the coins of Balāsh (484-488), brother of Firōz I, the name *Valkāsh* (which according to the polyphony of the Pahlavi letters was read *Vardā* a long time ago) is always preceded by the epithet *Hūkād* or *Hūgād*. In Pahlavi *hū* means "good" and *kād* or *gād* means "felicity" in Semitic; so the epithet signifies "the felicitous" or "the fortunate," like the Greek *εὐτυχής* (See Bartholomaei and Dorn above cited).

When *Khusrau II* was firmly established on the throne (summer 591), he set himself to remove all dangerous persons, especially Bindōe and the other conspirators who had overthrown his father and put him on the throne. Bistām, who was governor of *Khorāsān*, *Kūmis*, *Gurgān* and *Tabaristān*, was not so easily reached. When he saw himself condemned he made himself King in Media with the help of the remnants of *Bahrām Chōbīn*'s forces and in alliance with the Turks and the *Dēlamites*. On his defeat by *Khusrau*, he took refuge among the Turks who were at that time in possession of *Transoxiana*, where he fell by treachery.

This drachme of Bistām, with the regnal year ten, substantiates the statement of the Arab historian *Dīnāwari*—as against other authorities—whose account of the rebellion of Bistām is more detailed than that of *Tabari* and others. *Dīnāwari* says that *Khusrau* had to wait for ten years before he could avenge himself on Bistām. Accordingly Bistām may be said to have reigned for ten years, for he counted his regnal years from the time when *Khusrau* came to the throne. The first regnal year of *Khusrau* commenced from 27th June 590.

Noeldeke, however, is inclined to disbelieve *Dīnāwari*'s assertion on the ground that "in that case the great war against the Romans would already have begun even before the suppression of the rebellion, which must, however, have so much drained the military and financial resources of the state that above all it needed a number of peaceful years."

Noeldeke's argument does not seem to me to be very strong, as the Roman war began early in 604.

Noeldeke gives the period of rule of Bistām from the beginning of 592 to the beginning of 596. He commenced to rule during the second regnal year of *Khusrau*, which era he also adopted, and hence we do not meet with any coins of his first regnal year.

To understand better their regnal years, I give the first ten with their equivalent dates of the Christian era, compiled from Noeldeke.

*Regnal years.**Dates of Christian era.*

1	from 27th June 590 to 26th June 591
2	„ 27th „ 591 „ 25th „ 592
3	„ 26th „ 592 „ 25th „ 593
4	„ 26th „ 593 „ 25th „ 594
5	„ 26th „ 594 „ 25th „ 595
6	„ 26th „ 595 „ 24th „ 596
7	„ 25th „ 596 „ 24th „ 597
8	„ 25th „ 597 „ 24th „ 598
9	„ 25th „ 598 „ 24th „ 599
10	„ 25th „ 599 „ 23rd „ 600

Noeldeke, in his *Tabari*, devotes one whole chapter (pp. 478-487) on the rebellion of Bistām; Rawlinson, *Seventh Monarchy*, gives it in chapter XXIV; and Gutschmid treats of the event in the *Z.D.M.G.*, 1880, p. 748; these three being the chief authorities on this subject.

The genealogical table given at the end of this article shows the relationship existing between the house of Aspahbed, to which Bistām belonged, and the reigning house of Sāsān. (See *Justi's Namenbuch*, p. 429).

The legend on the obverse of the coin has not been read correctly, and the enlarged facsimile given of it is so distorted that I take this opportunity of indicating the proper rendering. The word *firōchī* in the facsimile, if given alone, could never be deciphered aright. The first letter might perhaps be read *īf* or *zf*, the second is a ligature, the like of which is not in the Pahlavi alphabet, and the rest can be distinctly read *zōchī*.

The legend on the obverse together with the monogram and the legend on the reverse, as copied from the original coin which the owner very kindly put at my disposal, are as follows:—

Obverse:—

۱۰۲۰

Firōchī

۱۰۲۰

Vistakhm

۱۰۲۰

afzūn

۱۰۲۰

monogram

Reverse :—

ashrā (ten)

RD (Hekatompylos)

Thus the legend "*Firōchī Vistakhm afzūn*" means "Long live Bistām the victorious."

Bestām is the Greek form Βεστράμ and Βεστράν of his name which is in Pahlavi *Vistakhma*, an Avestic name meaning "very strong." It is rendered *Ystaixuas* in the Perses or Æschylus and is found as Wstam and Westam in Armenian, Bistām in Arabic, and Gustehem in Firdousi. (See Drouin, *Les Légendes des Monnaies Sassanides*, *Revue Archéologique*, 1898, and also Justi's *Namenbuch*, p. 371).

It appears that Bistām struck coins at only one mint, which had for its monogram the letters RD.

This mint appears on coins for the first time during the rule of Bahrām IV (388-399), and was used during the reigns of Yezdegerd II (438-457), Firōz I (459-484) in 459-462, and 464, Balāsh (484-488), Kobād I (1st reign, 488-497), and then in 522 during the second reign (499-531) of Kobād I. Its period of greatest activity is from 531 to 629, when it issued coin for 78 years at any rate out of 98. This mint is known to have been working for 90 different years, and thus is the most prolific of all the Sāssānian mints.

Noeldeke (Z.D.M.G., 1877, p. 150; and 1879, p. 141) explains this monogram by Rai and the monogram RIU as Rew-Ardashir; but Mordtmann (Z.D.M.G., 1879, p. 120, no. 21) and De Morgan (*Revue Numismatique*, 1913, p. 490, § 134) identify the monogram RIU with Rai or Rei, this being identical with الری, the mint of the Khalifs for their dirhams, and the ancient Rhages in the vicinity of the modern Teheran.

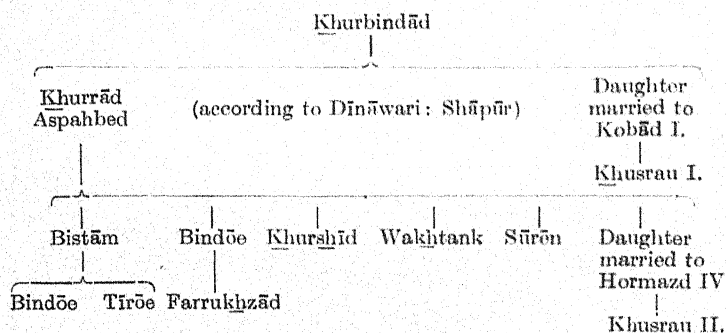
Mordtmann (Z.D.M.G., 1879, p. 117, no. 9) expresses a theory that the mint-mark RD is a kind of monogram for Hekatompylos: the letter R in Pahlavi signifying 100 and D being taken as the first letter of the word دروازه or "gate of door"; so that the Greek name Hekatompylos would be thus a free rendering of the monogram.

It was the first Parthian capital in Hyrcania, its ancient name being Tarima, the modern Shāhrūd (Lat. 32°22'N., Long. 54°59'E.).

In the lists of mints given by Mordtmann (Z.D.M.G., 1880, p. 133), we find the mint-monogram RD in the second and third regnal years of Khusrau II, then in his eighth and ninth, but not

in the tenth year. It again continues from the eleventh almost regularly onwards. It appears also from the second to the sixth regnal years of Bistām. From this it will be seen that the coins of Khusrau as well as Bistām were struck at this mint for their second and third regnal years. The coins of Khusrau of his second year were struck here during the early part of the year, whilst those of Bistām date from the latter part, when he revolted, the rebel striking his first coins with the regnal year two. The only known coins from this mint of the third year of Khusrau are of copper. Very possibly coins of other years still await discovery.

In the series of issues known to us from this mint the absence of Khusrau's coins of the tenth year is very striking, and the fact gains additional interest from the finding of this coin of that date bearing the name of the rebel. The problem of his reappearance invites speculation, but the materials at hand are so scanty that no useful purpose would be served by propounding a mere theory.



FURDOONJEE D. J. PARUCK.

6. Riddles Current in the District of Sylhet, in Eastern Bengal.

By SARAT CHANDRA MITRA, M.A., B.L.

It appears that Dr. W. Schultz of the Solway Institute, Bruxelles, is engaged in studying the riddles current in all countries of the world. He, therefore, requires collections of Oriental riddles, in an English garb, for his study-purposes. In response to his requisition, the two undermentioned collections of Parsee riddles have been made and published in the *Journal of the Anthropological Society of Bombay*.¹

The literature of Indian riddles, so far as known to me consists of the following papers :—

- (1) Riddles Current in Bihar. By the present writer. [Published in the *Journal of the Asiatic Society of Bengal*, Vol. LXX., Part III., No. 1 (for 1901), pp. 33—58].
- (2) Bihāri Life in Bihāri Riddles. By the present writer. (Published in the *Journal of the Anthropological Society of Bombay*, Vol. VII., No. 1, pp. 21—50).
- (3) Kashmiri Riddles. By the Rev. J. Hinton Knowles. [Published in the *Journal of the Asiatic Society of Bengal*, Vol. LVI., Part I., (for 1887), pp. 125—154].
- (4) A Few Parsee Riddles (Part I). By Rustamji Nasarvanji Munshi, Esqr. (Published in the *Journal of the Anthropological Society of Bombay*, Vol. X., No. 2, pp. 94—100).
- (5) A Few Parsee Riddles (Part II). By Rustamji Nasarvanji Munshi, Esqr. (Published in the *Journal of the Anthropological Society of Bombay*, Vol. X., No. 5, pp. 409—425).
- (6) Mūndārī Riddles. By the Rev. Paul Wagner. [Published in the *Journal of the Asiatic Society of Bengal*, Vol. LXXIII., Part I., (Extra No. for 1904)].
- (7) Six Specimens of Mūndārī Riddles. By Sarat Chandra Roy, Esqr., M.A., B.L. [Published at pp. 505-7 of his *The Mundas and Their Country* (Calcutta. 1912)].

¹ Vide the Bombay Anthropological Society's *Journal*, Vol. X., pp. 94ff. 409ff.

I also find that, in the *Baṅgīya Sāhitya Parishat Patrikā* (The Journal of the Academy of Bengali Literature at Calcutta), five papers on riddles current in different districts of Eastern and Northern Bengal have been published in Bengali and are as follows :—

- (1) *Chattagrāmī Chhelethakāna Dhāṇḍhā*. (Chittagong Riddles for Puzzling Children). By Moulyi Abdul Karim. [Published in the 12th volume (for 1312 B.S.), pages 177—188.]
- (2) A Collection of Nine Riddles from the District of Pābna, Eastern Bengal. By Pandit Rāj Kumār Kāvyabhūṣaṇa. [Published in the 14th volume (for 1314 B.S.), page 202.]
- (3) *Kochbihārer Henyāli* (Kuch Bihar Riddles). By Babu Pravāsh Chandra Bhattāchāryya. (Published in the 15th volume).
- (4) *Srīhatter Pami* (Sylhet Riddles). By Babu Dwārkanāth Chaudhurī, B.A. [Published in the 20th volume (for 1320 B. S.), pages 77—80.]
- (5) A Collection of Riddles from the District of Murshidabad. (Published in the 20th volume).

As these five papers are in Bengali, they are inaccessible, for purposes of study, to Orientalists in Europe, America and other parts of India. But, at the same time, they are highly interesting from an ethnographical, as also from a philological point of view. It, therefore, appears to me that, if these collections of riddles be transliterated into Devanāgarī characters and translated into English with notes on the interesting features thereof, they will become available for study—purposes not only to Dr. Schultz but also to other scholars who may be interested in this branch of Oriental research. In this hope, I intend to publish, in this article, the transliterations (in Devanāgarī characters) and the translations into English, with short notes thereon, of a selection of the riddles current in the district of Sylhet, which have been collected and published by Babu Dwārkanāth Chaudhurī in the Bengali quarterly periodical mentioned *supra*. In Sylhet, riddles are called *বড়*.

These riddles from Sylhet are 41 in number and in the peculiar dialect of Bengali which is spoken in that district. The collector has published them without sufficiently elucidatory notes and without classifying them under proper heads. I have omitted four riddles as I have not been able to make out the meanings thereof. I have classified the remaining 37 under the heads of (1) Vegetable Products; (2) Human Beings, Fish and Insects; (3) Articles of Furniture and Household Implements; (4) Heavenly Bodies and Natural Phenomena; (5) Condiment, etc.; and (6) Miscellaneous. I now give below the transliterations and translations thereof :—

(I). VEGETABLE PRODUCTS.

(१) तिन अक्षरे नाम बार भाजा हय भाला ।

माफेर अक्षर क्वाड़ि दिले नाम हय कला ॥

उत्तर - करला ।

Translation.

(1) The thing, of which the name consists of three letters, becomes delicious (to eat) when it is fried.

If you omit the midmost letter *ra* (र), its name becomes *kalā* (कला) which means "*plantain*."Answer.—The *karalā* or the fruit of the creeper *Momordica charantia* (Order *Cucurbitaceæ*). It is bitterish in taste and possesses, according to the *Ayurveda*, medicinal properties. It is, therefore, esteemed as a culinary vegetable in Bengal and Bihar. The smaller variety is called *uchhe* and botanically known as *M. muricata*.

(२) तले माटी उपरे माटी मध्ये सुन्दरी बेटौ ।

उत्तर - हलुद ।

Translation.

(2) Below (her) is the earth ; above (her) is the earth ; in the middle is a beautiful girl.

Answer.—The turmeric. It is likened to a beautiful girl on account of its beautiful yellow colour.

(३) दशशिर नय रावण धरे आषाढ़ आबण ।

उत्तर - भिङ्गा ।

Translation.(3) Although it possesses *ten heads*, it is not *Rāvaṇa* (the demon King of *Lankā* who had *ten heads*). It is produced in the months of *Āsādh* (June-July) and *Srāvaṇa* (July-August).Answer.—The *jhīngā* or the fruit of the creeper *Luffa acutangula* (Order *Cucurbitaceæ*) which comes into season during the rains. It is esteemed as a culinary vegetable both in Bengal and Bihar.*Note.*The riddle involves a play upon the word *sir* (शिर) which means both 'the head' as also 'a vein' or 'a raised ridge.' The *jhīngā* has ten veins or raised ridges on its peel. Therefore it has been called *dasasir* (दशशिर) which means both "*possessed of ten raised ridges*" as also "*ten-headed*," which latter epithet is applicable to the demon-king *Rāvaṇa*.

- (३) इकड़ेर तले तले भिकमतिर छानि ।
 कोन् देशे देखिथाक गाक़ेर आगाय पानि ॥
 उत्तर — नारिकेल ।

Translation.

- (4) Below the roots are Bhikmati's *chhāni*.
 In what country have you seen water at the top of a tree ?
 Answer.—The cocoanut.

Note.

I have translated the word इकड as meaning "roots." But I have not been able to find out the meaning of the words भिकमतिर छानि. The word भिकमति may be the name of some woman. It occurs again in the next riddle.

This riddle is similar, in one respect, to the Parsee riddle about the cocoanut which is published at page 421 of the Bombay Anthropological Society's *Journal*, Vol. X. It is as follows :—

"Though there is water, there is no fish. Though there is a sky, there are no stars. Answer.—Cocoanut."

The fact of the cocoanut's containing water inside it has been pointed out in both the Sylhet and Parsee riddles as the peculiar characteristic of this fruit.

- (4) इकड़ेर तले तले भिकमतिर गाक़ ।
 फ़ल नाइ गुटा नाइ धरे बारमास ॥
 उत्तर — पान ।

Translation.

- (5) Below the roots is Bhikmati's tree.
 Although it does not bear flowers or fruits, it bears leaves all the year round.
 Answer.—The betel-vine.

Note.

The meaning of the first line is obscure. As I have said above, I have not been able to find out the meaning of the word भिकमति. I have translated the word गुटा as meaning "fruit."

This riddle bears a striking similarity to the Hindi riddle about the betel-creeper which has been published by me at page 30 of the Bombay Anthropological Society's *Journal*, Vol. VII. It is as follows :—

- "(What is that) which neither bears fruits nor flowers, but which is plucked by basketfuls ?"
 Answer.—The betel-creeper and its leaf.

The fact of the betel-vine's bearing neither fruits nor flowers but only leaves has been pointed out in both the Sylhet and Hindi riddles as the peculiar characteristic of this plant.

(ई) इरि इरि बिन्ना तिरि तिरि पात ।

बाड़ीर बिन्ना चब्बिश् हात ॥

उत्तर - सुपारीगाक ।

Translation.

(6) The *iri iri* plant has *tiri tiri* leaves.

The plant of the house (is) 24 cubits (long).

Answer.—The areca-palm.

I am unable to make out the meanings of the words इरिइरि and तिरितिरि as the gentleman, who has collected these riddles, has not given the same.

(७) राजार बाड़ीर घोड़ी, एकै बियाने बुड़ी ।

उत्तर - कलागाक ।

Translation.

(7) The mare belonging to the king's palace becomes old after having foaled but once.

Answer.—The plantain-tree (*Musa sapientum*).

Note.

This riddle mentions the remarkable character of this tree, namely, that it bears the bunch of fruits only once and that, thereafter, it becomes useless and is, therefore, cut down for the sake of the inmost pith of its trunk which is used as a culinary vegetable. But the other distinguishing features of this tree are mentioned in the undernoted Hindi riddle No. 12 of my collection published in the Bombay Anthropological Society's *Journal*, Vol. VII. :—

“ (What is that) which has only one flower, but hundreds of fruits ? ”

Answer.—The plantain-tree.

Also compare the above with the following Hindi riddle forming No. 15 of my J.A.S.B. collection :—

“ Its leg is like a pillar ; its leaves are broad ; its fruits hang down in bunches and its fruits are sweet.”

Answer.—The plantain-tree.

(८) माटीर तले याके बेटौ,

तेना पिन्हे आटि आटि ।

नापिते ना क्य धुपाय ना धय,
तेखो बेटी काप रय ॥

उत्तर - पिंयाज, रसुन ।

Translation.

- (8) 1. The girl lives below the ground,
2. (And) wears rags very tightly.
3. (Although) the barber does not shave her (lit., does not touch her), and the washerman does not wash (her clothes),
4. Still the girl lives clean and spruce.
Answer.—The onion and the garlic.

Note.

The most distinguishing feature of an onion or a garlic is that the fleshy layers of these succulent vegetables overlap each other. These have been likened to the rags which a poor girl wears tightly tied over her person. This distinguishing feature of the onion has also been pointed out in the under-mentioned Parsee riddles published at page 412 of the Bombay Anthropological Society's *Journal*, Vol. X. :—

(a) "A stunted little Gokuldas putting on fifty to hundred clothes (i.e., layers)."

Answer.—Onion.

(b) "Coat over coat do I put on and hot-tempered am I ;
To some do I appear white, to others even red."

Answer. Onion.

It has also been pointed out in the following Hindi riddle numbered 28 in my J.A.S.B. collection :—

"She is the daughter of a king, and the granddaughter of Humel.

She wears a thousand pieces of clothing tied round her with knots."

Answer.—Onion.

The philological peculiarities of the foregoing Sylhet riddle are :—The word *tenā* (तेना) means "a rag" ; *pindhe* (पिन्धे) means "wears" ; *chhaya* (छय) means "touches" ; *dhayr* (धय) means "washes" ; and *teo* (तेखो) means "still."

(६) हातीर दांत कदम्बेर पात ।

उत्तर—मूला ।

Translation.

(9) An elephant's tusk (with) the leaves of the *Kadamba* tree (*Nauclea cadamba*).

Answer.—The radish.

Note.

The tapering white radish has been very aptly likened to an elephant's tusk in the foregoing riddle, and to a silver nail in the following Parsee riddle published at page 414 of the Bombay Anthropological Society's *Journal*, Vol. X. :—

"A silver nail in a jungle or forest." Answer.—The radish.

In another Parsee riddle about the radish, published in the same page, its white fleshy portion has been likened to a white beard, while its crown of green leaves has been likened to green moustaches. This comparison seems to me to be somewhat far-fetched. The same remark also applies to its comparison with a small girl going to the market with her frock on, in the Hindi riddle No. 27 in my J.A.S.B. collection.

(६ क) तिन तेरेङ्गा घानेर भेङ्गा ।

गुटा मधुर पात राङ्गा ॥

उत्तर—भिङ्गाइर ।

Translation.

(9A) (What is that which has) three spines and is the *bhengā* of the paddy,

(And of which) the fruits are sweet, and the leaves are red ?

Answer.—The Water Chestnut (*Trapa bispinosa*).

Note.

I have translated the word *terengā* (तेरेङ्गा) into "*spines*." This nut has two lateral spines and one in the middle. But I have not been able to make out the meaning of the word *bhengā* (भेङ्गा). The word *guṭā* (गुटा) means "*fruits*." The fruits have been called sweet, because these nuts are delicious eating. The flour made from them is considered by the Indians as a cooling and nutritious article of food in bilious affections and diarrhoea.

Now I come to class—

(II). HUMAN BEINGS, FISH AND INSECTS.

(१०) पेट एक माथा,

दुइ हात कुडि आङ्गुल नाकटा ।

चक्षुर्कय नाइ समन जन्तु कोथाय पाइ ॥

उत्तर—मानुष ।

Translation.

(10) (It has a) belly, back and head.
Two hands, twenty fingers, and one nose.
(Two) eyes and ears, (and) one navel. Where shall I get
such an animal?

Answer.—Man.

Note.

The word *नाइ* (*nāi*) in the 3rd line of the above riddle means “navel.”

(११) एइ पाड़े खागड़ा सेइ पारे खागड़ा ।

दुइ खागड़ाय भगड़ा ॥

उत्तर — चक्षरे पातार लोम ।

Translation.

(11) (There are), on this bank, a reed, and, on the other
bank, (another) reed.

There is a quarrel between the two reeds.

Answer.—The eyelashes.

Note.

In this riddle, the upper and the lower eyelids have been likened to two reeds (with their tufted flower-spikes), one on each bank of a river (which represents the cavity of the eye); and their constantly moving up and down has been compared with the quarrelling (*i.e.*, the being wafted to and fro by the wind) of the two reeds.

(१२) एक अक्षरे नाम बार ऐकार दिया पाछे ।

कर्णमूले भर करिया अक्षरे उपर नाचे ॥

उत्तर — कैमाक ।

Translation.

(12) (It is a creature) of which the name is made up of one
letter with the *aikār* (the vowel ऐ) tacked on to its back,

And which, placing its weight on its gills, dances upon the
earth.

Answer.—The *Kai* fish or the climbing perch (*Anabas scandens*) which is considered delicious eating in all parts of
Bengal.

Note.

The word *al* (अल), in the above riddle, means “the earth or
ground.”

(१३) दले थाके दलकुमारी दले ताइर बासा ॥

हाड़ नाइ गुड़ नाइ माङ्गल लुसा लुसा ॥

उत्तर - पोक ।

Translation.

(13) The girl of the company goes about in company and lodges with the company.

She has no bones; *māṅgal lusā lusā*.

Answer.—An insect.

Note.

I have translated the word *dalkumārī* (दलकुमारी) as meaning “the girl of the company” (referring to the habits of insects of going about in swarms). The word *tāir* (ताइर) means ‘her.’ I have taken the words *hāḍ-guḍ* (हाड़-गुड़) as meaning ‘bones.’ As the collector has not given the meaning of the words *māṅgal lusā lusā* (माङ्गल लुसालुसा), I have been unable to translate the same.

(१४) लाखबरण कयचरण पेट काटिले हांटे ।

मूर्खे कि भाङ्गाइवा यण्डितेरइ फाटे ॥

उत्तर—खामपिपड़ा ।

Translation.

(14) (It is) red-coloured, (possesses) six legs, (and) moves about even when its stomach is cut.

How can the ignorant solve (this riddle), when even the learned feels difficulty in doing so?

Answer.—The red ant which infests mango trees.

Note.

I have translated the word *bhāṅgāibā* (भाङ्गाइवा) as meaning “solve this riddle,” and the word *phāte* (फाटे) as meaning “feels difficulty in solving it.”

(१५) पंइ दिलु पंइ हात ।

कोन् पाखीर पोन्दे दांत ॥

उत्तर - वोलता ।

Translation.

(15) *Pami dilu pami hāt.*

What bird has got a tooth in its rectum?

Answer.—The wasp

Note.

I have been unable to translate the first line, as the collector has not given the meanings of the obscure words therein. The tooth is the wasp's sting.

(१६) माक़ेर नाइ माथा, गाक़ेर नाइ पाता, पक्षीर नाइ ढिम ।

एरे ये भाङ्गाइते पारे हज़ार टाका दिम् ॥

उत्तर - काकड़ा, सिजगाक़, बादुर ।

Translation.

(16) The fish has not got any head ; the tree has not got any leaves ; the bird does not lay any eggs.

I shall pay one thousand rupees to him who can solve this riddle.

Answer.—The crab. The plant *Euphorbia antiquorum* or *E. neriiifolia*.—The bat.

Note.

The crab has not got any head. The Euphorbia plants do not bear any leaves. The bat is, zoologically speaking, a mammal and does not lay eggs.

The word *bhāṅghāite* (भाङ्गाइते), in this riddle, bears the meaning “to solve a riddle” as it does in the riddle No. 14 *supra*. The word *dim* (दिम्) is another philological novelty and means “I shall give.”

(१७) निकाइल पुंकाइल घरखिनि तात ना पाड़ काइ ।

सोनार कटरा भाङ्गिले गड़ाइ देखोया नाइ ॥

उत्तर - ढिम ।

Translation.

(17) The room has been washed with water which has been wiped off, and does not contain any clotted mud therein.

If the golden cup gets broken, the goldsmith's wages have not to be paid.

Answer.—An egg.

Note.

The philological novelties in this riddle are the words *gharkhīni* (घरखिनि) meaning “the room”, *tāta* (तात) meaning “therein”, *kāi* (काइ) meaning “clotted mud”, and *gadāi* (गड़ाइ) meaning “goldsmith's wages.”

An egg has been likened to a golden cup on account of its containing the yellow-coloured yolk. It is for this reason that.

when an egg is held in a strong light, it emits a golden effulgence. To my mind, the Parsee riddle about an egg, published at page 415 of Vol. X. of the Bombay Anthropological Society's *Journal*, is more expressive of its appearance and attributes. It is as follows :—

“There is a jar which contains two kinds of ghee or clarified butter.” Answer.—An egg.

Then I come to class—

(III). ARTICLES OF FURNITURE AND HOUSEHOLD
IMPLEMENTS.

(१८) तिन अक्षरे नाम बार सर्व्वघरे आछे ।

पाछेर अक्षर छाड़ि दिले केहू ना याय काछे ॥

आगेर अक्षर छाड़ि दिले सर्व्वलोके खाय ।

माझेर अक्षर छाड़ि दिले राम-गुणागुण गाय ॥

उत्तर — बिछाना ।

Translation.

(18) (1) The thing, of which the name consists of three letters, is to be found in every house.

(2) Nobody goes near what is left, if you omit the last letter.

(3) Everybody eats what is left, if you omit the first letter.

(4) If you omit the midmost letter, (what remains) sings the praises of Rāma.

Answer.—A bed.

Note.

If the last letter *nā* (न) is omitted, the word *bichhā* (बिछा), which means “a centipede,” is left. Of course, nobody comes near a centipede for fear of getting stung by it. If the first letter *bi* (बि) is omitted, the word *chhānā* (छाना), which means “clotted cream,” is left. Everybody eats it. If the midmost letter *chhā* (छा) is omitted, the word *binā* (बिना) is left. It means “an Indian lyre” to the accompaniment of which hymns in praise of Rāma and other religious songs are sung.

(१९) कालीयाना बुड़ीगुलि नाक ताइर नथ ।

पिङ्ग नियारा काधड़ तालुवाय ताइर पथ ।

उत्तर — सिन्दुक ।

Translation.

(19) A black-complexioned old lady has in her nose a nose-ring,

And wears a thick cloth. On the upper portion is her hole.
Answer.—A chest.

Note.

A black-coloured chest (most likely an iron-chest) is likened to a dark-complexioned old lady. The large padlock with which it is shut up is likened to the ring in her nose. The covering of thick cloth with which it is protected from the dust is likened to the thick *sari* she has on. The hole in the upper portion is the keyhole in the upper surface of the iron-chest.

The philological novelties in this riddle are the words *kālānā* (कालीयाना) which means “black-complexioned”; *fāir* (फाइर) means “her”; *pīhu* (पिहू) means “wearing”; *niyārā* (नियारा) means “thick”; and *fālubāya* (फालुबाय) means “on the upper surface.”

(२०) मामाय दिला पुखुरी भागिनाय दिला पारं ।

टीयापाखीरे पानि खाइते देखाय संसार ॥

उत्तर — आयना ।

Translation.

(20) The tank was given by the maternal uncle; the bank was given by the sister's son.

The green parrot, while drinking water, sees the whole world.

Answer. A looking-glass.

Note.

The water of the tank, glistening with the sun's rays reflected therein, is compared with the bright surface of the looking-glass. The parrot, while drinking water from the tank, sees its own image as also those of the surrounding objects reflected therein, just as a person looking into a mirror sees his own image depicted therein.

The word *pukhuri* (पुखुरी) means “a tank”; and *pār* (पार) means “the bank of a river or tank.” This latter word occurs in riddle No. 11 *supra*.

(२१) एकखाने दुइखाने तिनखाने जोड़ा ।

तार उपर बसाइल आनि फुरि आंठार गोड़ा ॥

उत्तर — ऊका-कल्की ।

Translation.

(21) (It is a thing) made up of a first, a second and a third piece.

A live charcoal is brought and placed on its top.

Answer.—The hubble-bubble and the *chillam*.

Note.

The first piece of the hubble-bubble is its bowl containing water; the second piece is its tube standing upright on the bowl; and the third is the *chillam* (or the small pan containing the tobacco and live charcoal heaped therein) on the top of the tube. Compare this riddle from Sylhet with the Hindi riddles Nos. 43, 44 and 45 of my J.A.S.B. collection, and with the Kashmiri riddle No. 96 of Knowles' collection.

The most interesting philological feature of this riddle is the expression *phuri āngtār goḷā* (फुरि आंठार गोड़ा) which means "a piece of live charcoal."

(२२) एक गुजा, गुजाय धरे मरा, मराय धरे जिता ।

उत्तर — बड़शी ।

Translation.

(22) One rod; the rod bears (at its end) a dead (worm); the dead (worm) catches a live (fish).

Answer.—An angling hook.

Note.

The word *gujā* (गुजा), in this riddle, means 'a fishing-rod'; *marā* (मरा) means 'a dead worm'; and *jītā* (जिता) means 'a live fish.'

(२३) राजार बाड़ीर मेनागाइ मेन्मेनाइया चाय ।

हाजार टाकार मरिच खाइया आरौ खाइते चाय ॥

उत्तर — मसलावाटा शिल ।

Translation.

(23) A cow with curved horns, belonging to the king's palace, looks with half-closed eyes.

And, after having partaken of cayenne pepper worth one thousand rupees, wants to eat more.

Answer.—A hone for pounding spices upon.

Note.

The philological novelties of this riddle are the words *menāgāi* (मेनागार) and *menmenāiyā* (मेनमेनाइया). The former

means 'a cow whose horns curve towards each side of the head'; and the latter means 'with half-closed eyes.'

To my mind, the comparison of a hone or curry-stone with a cow seems far-fetched. The second line, of course, refers to the unlimited quantity of spices that can be pounded upon it. Compare it with the riddle (No. 25) about a curry-stone published by me at page 43 of Vol. X. of the Bombay Anthropological Society's *Journal*. This latter is more expressive.

(२४) गाङ्गपारेर बुडौगुलि नव धान कुटे ।

कांकासित पाड़ा दिले केकात करि उठे ।

उत्तर - डेकौ ।

Translation.

(24) On the other side of the river, the old woman pounds the newly-harvested paddy.

If anybody places his foot on (her) waist, she utters the cry of "kekkaṭa."

Answer.—The pedal or machine for husking corn.

Note.

The pedal is placed on a lever and has, on one of its ends, a pestle which fits into a cavity in the ground wherein the corn to be husked is placed. It is worked by a person placing his foot on the other end of the pedal, which being done its pestle-end is lifted up. As soon as he removes his foot from the pedal, its pestle-end falls into the cavity and husks the corn. The husked corn is then removed; and a fresh supply of unhusked corn is placed inside the cavity, and the pedal is then raised and let fall in the aforementioned way. And so on and so on.

Here the pedal is likened to an old woman. The act of the person working it by placing his foot on the other end of the lever, is likened to his placing his foot on her waist. I have translated the words *budīguli* (बुडौगुलि) as meaning "an old lady"; *kāmkālita* (कांकासित) as meaning "on the waist"; and *pādādile* (पाड़ादिले) into "by placing the foot." The word *kekkaṭa* (केकात) means the heavy thud made by the pestle-end of the pedal falling into the cavity.

Then I come to class—

(IV). HEAVENLY BODIES AND NATURAL PHENOMENA.

(२५) राजार बेटा मरिया रहके कान्दिबार नाइ ।

राजार उठान पड़िया रहके भाड़िबार नाइ ।

माली फुल फुटिया रहके तुलिबार नाइ ॥

उत्तर - चन्द्र, आकाश, वज्र ।

Translation.

(25) The king's son is lying dead, (and there is nobody) to weep (for him).

The king's courtyard is lying (unswept), (and there is nobody to sweep it).

The flowers have bloomed, and there is no florist to pluck them.

Answer.—The moon—the sky—the stars.

Note.

The comparison of the moon with the king's dead son seems to me to be far-fetched. But the likening of the sky to the king's unswept courtyard, and that of the stars to the blooming flowers in a garden, seem to me to be apt. The last-mentioned concept is a beautiful one.

On the contrary, the following Parsee riddles about the sun and the moon and the stars, published at pages 97 and 98 of Vol. X. of the Bombay Anthropological Society's *Journal*, appear to be more apposite :—

(a) "The brother goes out for a walk in the morning, and the sister strolls about at night." Answer.—The Sun and the Moon. Here the Sun is spoken of as the brother, and the Moon as the sister—a relationship which is supposed by many races of people to exist.

(b) "A plateful of mustard (seeds) which could not be counted by anybody." Answer.—The stars. Here the sky is likened to a plate, and the stars therein to mustard seeds. This Parsee riddle has close parallels in the following Bengali and Hindi riddles about the stars which have been published by me at page 46 of Vol. VII. of the Bombay Anthropological Society's *Journal* :—

(c) "There is one trayful of areca-nuts, which the trader even cannot count." Answer.—The stars.

(d) "A handful of parched rice scattered over the whole yard." Answer.—The stars.

(२६) आल भन्भन् आल कन्कन् आल निल चोरे ।

अनिल पर्वतेर आगुन के निबाइते पारे ॥

उत्तर — सौंद ।

Translation.

(26) The light is strong and fierce; the light has been stolen by the thief.

Who can extinguish the fire on the hill called Anil ?

Answer.—The sun's rays.

Note.

I have translated the words कन्कन् and कन्कन् as meaning 'strong and fierce.' The meaning of the expression "The light has been stolen by the thief" is obscure. The collector has given the meaning of the word "anilparbat" as meaning "the hill on which the sun rises." But I cannot make out why this hill should be called Anil. I have therefore preferred to translate the word as meaning "the hill called Anil."

(२७) एइ देख्लाम एइ नाइ ।

कि कइमु राजार ठाँइ ॥

उत्तर — बिद्युत् ।

Translation.

(27) I have just now seen it ; but it does not exist any more.

What shall I say in the king's presence ?

Answer.—The lightning.

Note.

The first line refers to the evanescent character of the lightning. Its other attributes are explicitly expressed in the following Parsee riddle about the lightning, which has been published at page 421 of Vol. X. of the Bombay Anthropological Society's *Journal* :—

"I was white when I came and black when I went. I burnt those who came into my clutches." Answer.—The lightning.

(२८) साग्तने पड़िल लाटम् भूइते आगुन ज्वले ।

आमार ठाकुर बेदिके चाय सेदिके जोकाड़ पड़े ॥

उत्तर — भूमिकम्प ।

Translation.

(28) A spinning top has fallen from the sky. A fire burns upon the ground.

Cries of 'ulu, ulu' are uttered in whatever direction my deity looks.

Answer.—The earthquake.

Note.

I have translated the word *lātam* (लाटम्) as meaning 'a spinning top.' Just as a top when twirled about spins round, so it may refer to the oscillating movement of the earth's surface caused by an earthquake. The meaning of the words "A fire burns upon the ground" seems to be obscure. Does it give an

inkling of the idea possessed by the primitive composer of this riddle that earthquakes are caused by subterraneous fires ?

Stripped of its metaphor, the second line means that "wherever earthquakes occur, cries of 'ulu, ulu' are uttered." It refers to a custom which prevails among the Hindus of Bengal. The Hindus throughout India believe that whenever the god Vishnu, in his Boar-incarnation, transfers the burden of the world from one of his tusks to another, earthquakes take place. Another popular explanation is that the earth-tremor is caused by the great bull or elephant, which supports the world, changing his posture. At any rate, whenever earthquakes take place, it is the custom in Western Bengal to blow conches, ring bells and sound gongs. It would appear from the foregoing riddle that the custom exists, in Sylhet and other parts of Eastern Bengal, of the women's uttering cries of 'ulu, ulu' on the occasion of this natural phenomenon.

(२९) गाङ्गपार मरिचगाक् हालुडुलु करे ।

कोन् माइर एते तार कानि याइते पारे ॥

उत्तर - छाया ।

Translation.

(29) On the other side of the river, a cayenne pepper plant waves to and fro.

What mother's son can go near it ?

Answer.—The shadow.

Note.

Stripped of its metaphor, the meaning of the second line is that nobody can stand upon his own shadow.

Compare it with the following Parsee riddle about the shadow (published at page 98 of Vol. X. of the Bombay Anthropological Society's *Journal*) which sets forth its characteristics more expressively :—

"What is that thing, which has neither flesh, blood nor bone, and which, though inanimate, moves freely about ?"

Answer.—The shadow.

Then I come to class—

(V). CONDIMENT, ETC.

(३०) उठान ठन्ठन् बाड़ौत नाइ ।

खाइ बस्तुर बाकल नाइ ॥

उत्तर - लवण ।

Translation.

(30) The courtyard is empty. It has no house.

The edible substance has no bark.

Answer.—Salt.

Note.

I have translated the words *than than* (ठन्ठन्) as meaning "empty." But the meaning of the whole of the first line is obscure. I have translated the word *khāi* (खाइ) as meaning "edible."

On the contrary, the following Parsee riddle about salt (published at page 100 of Vol. X. of the Bombay Anthropological Society's *Journal*) expresses the attributes of this condiment more explicitly:—

"Though white, yet it is not sugar; though bright, yet it is not glass; though melting, yet it is not snow; but you always eat it." Answer.—Salt.

(३१) उठान ठन्ठन् बैठक माटी ।

कोन् कुमारे गड़के घटी ॥

बिना दुधे हैके दै ।

एमन कुमार पाइसु कै ॥

उत्तर — चूना ।

Translation.

- (31) 1. The courtyard is empty. Its seat is the earth.
2. What potter is making the bowl.
3. (Within which) curdled milk is being made without milk?
4. How shall I find such a potter?

Answer.—Quicklime.

Note.

The expression "*uthān than than*" (उठान ठन्ठन्) also occurs in the previous riddle; and I have translated it accordingly. The words *baiṭhak mātī* (बैठकमाटी), perhaps, refer to the fact that quicklime is produced by burning limestone which is found in quarries beneath the ground. The third and fourth lines allude to the fact that, when dry quicklime is placed in a vat and water is poured over it, it bubbles and effervesces and becomes wet lime which, in appearance, is like curdled milk.

Then I come to the last class—

(VI). MISCELLANEOUS.

(३२) कुठा कुठा नब कुठा बेत लागे चाग्रौ मोटा ।

सुन रे कामला भाइ, एकटि बेतेर बान्ध बाइ

उत्तर — दालान ।

Translation.

(32) *Kuthā kuthā nava kuthā*. It requires eighty thick rattan canes.

O brother Kāmlā ! Hear me. One of the rattan canes has got no fastening.

Answer.—A house or hall.

Note.

I have not been able to translate the words *kuthā kuthā nava kuthā*. The meaning of the two lines composing this riddle is very obscure.

(३३) घुमूत उठि ताते हाते ।

उत्तर — दरज़ार खिल ।

Translation.

(33) Awaking from sleep, (one has to place his) hand on it.

Answer.—The latch of a door.

Note.

As soon as a person awakes from sleep and has to go outside the room, he has to open the door by unfastening the latch with his hand.

(३४) यह खाने काटिलाम गाछ ।

गाछ गेल भानुगाछ ॥

उत्तर — सड़क ।

Translation.

(34) Here I have cut down a tree.

The tree went to a distant place named Bhānugāchha.

Answer.—A road.

Note.

The meaning of this riddle is far-fetched. On the other hand, the undermentioned Parsee riddle about the road (published at page 417 of Vol. X. of the Bombay Anthropological Society's *Journal*) is more apposite :—"There is a substance which, though it follows us wherever we go, is stationary."

Answer.—The road.

(३५) मत्स्य नय मांस नय सर्व्वलोके खाय ।

सभाते खाइले बड़ लज्जा पाय ॥

उत्तर — आकाड़ ।

Translation.

(35) Though it is neither fish nor flesh, yet everybody eats it.

If anybody eats it in the presence of other men, he feels greatly ashamed.

Answer.—A fall upon the ground.

Note.

The Bengali idiom for falling upon the ground, either by stumbling or slipping the foot, is *āchhād khāwā* (আছাড় খাবোয়া) which, literally translated, means “to eat a fall.” Hence the metaphor of eating has been used in the above riddle.

(৩৫) নাকদত্তের ঘন আঙুলদত্তে পাইলা ।

অধিক যতনে তারে বেড়ি তুলি যাইলা ॥

উত্তর — নাকের সোঁপা ।

Translation.

(36) *Ānguladatta* (i.e., the fingers) received *Nākadatta*'s (i.e., the nose's) treasure,

And, after getting hold of the same with great care, placed it elsewhere.

Answer.—The mucus of the nose.


Note.

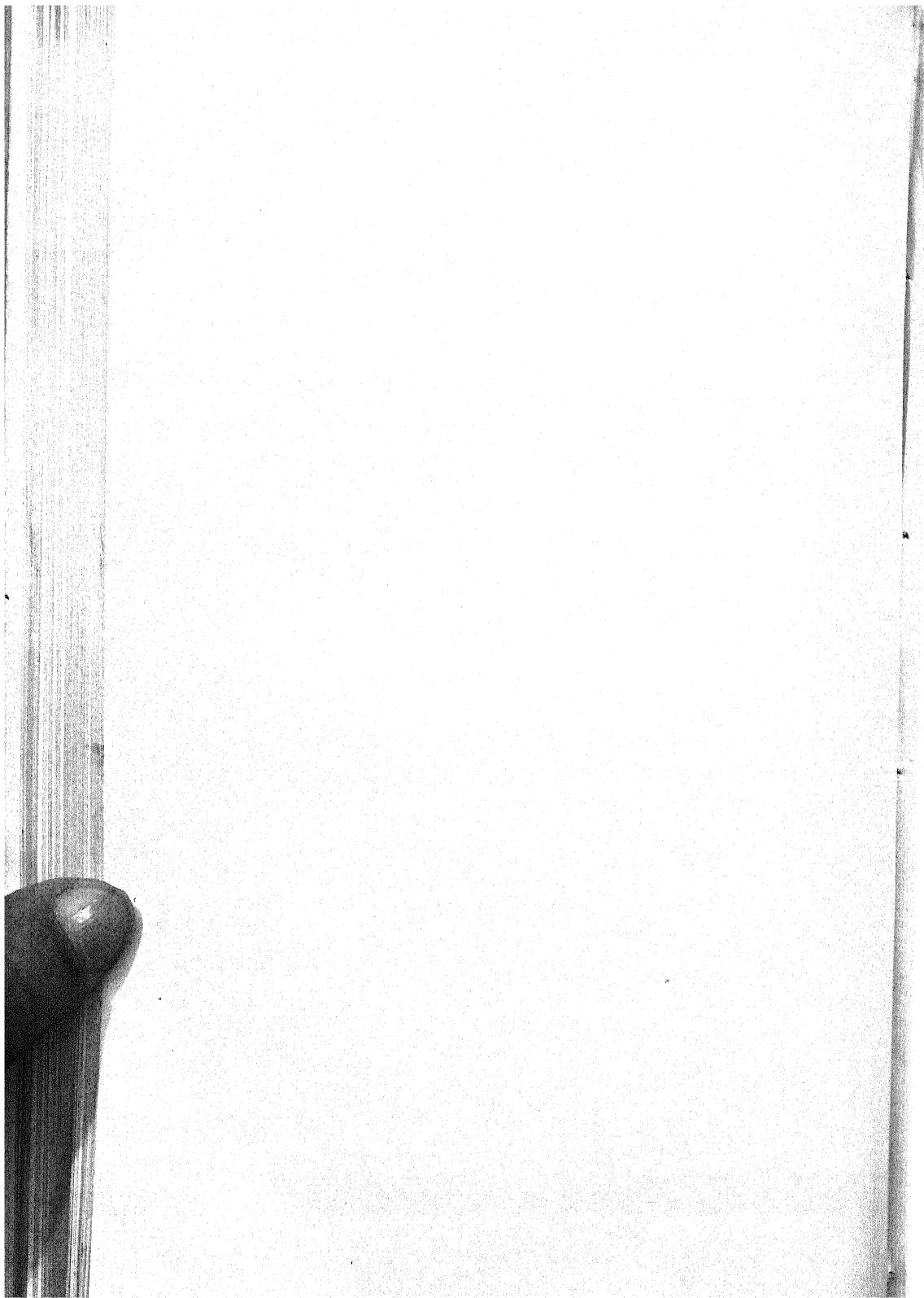
The nose, from which the mucus is taken out with the aid of the fingers and thrown away, has been personified here as *Nākadatta*; whereas the fingers have been personified as *Ānguladatta*. The word *thailā* (তাইলা) means “placed.”

The comparative study of riddles current in different parts of the world is of great interest to the ethnographer, as it shows the identity of humour of the different races of people inhabiting various parts of the same country, separated from each other by long distances, or even different countries of the world, separated from each other by vast oceans and high mountain-ranges. The truth of this will appear from the parallelisms, which have been pointed out above, between the riddles current among the Bengalis of Sylhet and those in vogue among the Hindus of Bihar and the Parsees of Bombay. Mr. Andrew Long, the *doyen* of English folklore study, has very rightly said: “Proverbs and riddles are as universally scattered, and the Wolufs puzzle over the same *devinettes* as the Scotch schoolboy or the Breton peasant. Thus, for instance, the Wolufs of Senegal ask each other: ‘What flies for ever, and rests never?’ Answer.—‘The Wind.’ ‘Who are the comrades that always fight, and never hurt each other?’

Answer.—‘The Teeth.’ (Compare this with the Sylhet riddle No. 11 *supra*). In France, as we read in the ‘Recueil de Calembours,’ the people ask : ‘What runs faster than a horse, crosses water, and is not wet ?’ Answer.—‘The Sun.’ The Samoans put the riddle : ‘A man who stands between two ravenous fishes ?’ Answer.—‘The tongue between the teeth.’ Again, ‘There are twenty brothers, each with a hat on his head ?’ Answer.—‘Fingers and toes, with nails for hats.’ This is like the French ‘*un père a douze fils ?*’—‘*l’an*.’ A comparison of Rolland’s ‘*Devinettes*’ with the Woluf conundrums of Boilat, the Samoan examples in Turner’s ‘Samoa,’ and the Scotch enigmas collected by Chambers, will show the identity of peasant and savage humour.”¹

¹ *Custom and Myth*. By Andrew Lang. London : Longmans, Green, and Co. 1893. p. 14.





7. 'Ālam Khān's Mosque at Katwa.¹

By MAULAVI 'ĀBDU'L WALLI.

The name Katwa is said to have been derived from the Sanskrit Katadwipa, and was therefore, in ancient times, an island like Nadia or Navadwipa. The town of Katwa, otherwise called Ganj-i-Murshidpūr, is the head-quarters of the subdivision of the same name of the Burdwan District, and is situated at the junction of the Bhāgirathi and the Ajay. It was regarded as the military key to Murshidabād. "In the Gola Ganj," says Long, "there are several hundred shops which sell sugar, cloth, iron, etc." At the beginning of the 18th century Katwa and the surrounding places greatly suffered from the raids of the Bargis or Maharattas whose yearly excursions depopulated the country and converted it into jungles. Nawāb 'Alī Vardi Khān used Katwa as a base against the invaders. He defeated them in 1742 in a battle outside the walls of the fort. The mud fort of Katwa was situated on a tongue of land at the confluence of Ajay and Bhāgirathi, about half a mile in circumference. It was here that Clive after an hour's meditation formed the decision to fight with Nawāb Sirāj-u'd-Daula, which was done on the 23rd June, 1757, on the battlefield of Plassey, with the result that India passed gradually into the hands of the British.

I visited the place on the 10th March, 1916. The Mosque, of which the inscriptions are given below, is situated at Baganiapara, on the bank of the river and by the side of the bazar. The Mosque is a large one. At the last great earthquake it suffered terribly, but the local Muslims had it repaired, and it has since been kept up in a good state of preservation.

According to Hāfiẓ 'Abdu's-Sattar, the husband of the lady who is the sole descendant of the builder of the Mosque, the Masjid was built by 'Ālam Khān. The latter and his brother Zulfiqār Khān lived at Delhi and were supporters of Jahāndār Shāh. After Jahāndār Shāh's defeat at Āgra and Zulfiqār Khān's death, 'Ālam Khān left Delhi with his son Bahrām; and, after wandering in various places, came and settled at Baganiapara in Katwa, when the Maharatta depredations were at its height.² The place being low, 'Ālam Khān raised it by

¹ The *Gazetteer* of the Burdwan District (1911) ascribes this Mosque to Murshid Quli Jafar Khan. This appears to be not accurate.

² The following Bengali couplet is still current in the District :—

"Chhelē ghumalo, pāṛa juralo, Bargi ālo deshē
Bulbuli-tē dhān kheyechhē, khajna debo kishē"

(The child has gone to sleep, the hamlet is quiet—(lo!) the Bargi has come into the country. The Bulbul has eaten up the paddy, how'll I pay the rent?)

digging a moat round the Mosque, which he built or rebuilt, and the hujra or *retreat* for prayer which he constructed close to it. The passage from his retreat to the riverside was through a gate, which I found was half shut up by the wall of a neighbour. A Persian inscription was carved very beautifully in bold *nasta'liq* character over the gate in white raised letters. The first half of the inscribed verse is now invisible. The eastern side of the Mosque is also disfigured by a tall building. The tomb of 'Ālam Khān and the retreat are in a dilapidated state.

I am not aware who the brothers 'Ālam Khān and Zulfiqār Khān might be. They cannot possibly be the two noblemen, whose history is recorded in the Ma'āsiru'l-Umarā and other books. Hāfiz 'Abdu's-Sattār admitted that they should not be confounded with the two noblemen—'Ālam Khān Baraha and Zulfiqār Khān Nugrat-Jang.

The marriage of Hāfiz 'Abdu's-Sattār with his wife is wonderfully dramatic. He was born at Dehli and is sixth in descent from Zulfiqār Khān. She was born at Katwa and is also sixth in descent from 'Ālam Khān. 'Abdu's-Sattār came to Bengal, as he told me, on board a trading boat which moored at Katwa to dispose of its cargoes. Arrived at the Baganiapara mosque to say his Jum'ā namāz, his eye caught sight of the name of 'Ālam Khān in the inscription in front of the Mosque. At last they became surprised to know that the would-be couple were the two branches of the same tree. After some years both were united in the happy bond of Islamic wedlock. On account of Hāfiz Sayyid 'Abdu's-Sattār making Katwa his home, the Muslim population of the place have become more regular in their observances of prayer and Islamic ceremonies.

The following are the texts of the inscriptions. The one in the interior of the Mosque above the pulpit has been marked A. The two on the outside of the Mosque, close to each other, are marked B and C, the former on the right side and the latter on the left of it.

A

الحمد لله رب العالمين و الصلوة على محمد وآله اجمعين
چراغ و مسجد و محراب و منبر ابو بكر و عمر عثمان و حيدر

B

بسم الله الرحمن الرحيم
نادا عَلِيًّا مظهر العجايب تجده عونا لك في النوايب ضيف كل هم و غم
سينجلي بنبتك يا محمد بولايتك يا علي يا علي يا علي *

¹ The fatha or zabar on ا is incorrect, it should be on 'ain of عليا.

² This word appears to be superfluous, and is not to be found in other copies of Nād-i-'Ālī that I have examined.

C

قال رسول الله صلى الله عليه وسلم من بني لله تعالى مسجداً في الدنيا فقد بني الله تعالى له بيتاً في الجنة هذا المسجد في عهد الخاقان الأعظم سلطان الأكبر الأفخم محمد فرخ سيروبادشاه الغازي خلد الله تعالى ملكه و سلطانه سنة ألف و مائة و سبعا و عشوين من الهجرة عالم خان *

Translation.

A. Praise be to God, the Lord of the Worlds, and (God's) blessings be upon Muhammad and all his family. The candle and the Mosque and the arch and the pulpit, Abu Bakr and Omar, Othman and 'Āli.

B. In the name of God the compassionate, the merciful. Invoke Ali, the Displayer of Wonders. Thou wilt find him to be a helper in thy calamities. All the cares and woes will presently be dispelled by thy prophetship, O Muhammad, and by thy Saintship O 'Āli, O 'Āli, O 'Āli.

C. Saith the Messenger of God, mercy of God be on him and blessings, "He who buildeth for God Almighty a Mosque on earth, verily God Almighty will build for him an abode in Paradise." This Mosque (was built) during the time of the Mighty Khāqān, the most high and exalted Sultān, Muhammad Farrukh Siyar Bādshāh Ghāzi. May God Almighty perpetuate his Kingdom and Sovereignty. (In the) year of Hijrat One thousand and one hundred and twenty-seven (1715 A.D.). 'Ālam Khān.

The Emperor Farrukh Siyar reigned from 1124-1131 H. (1713-1719 A.D.).

Notes.

Besides what I have heard and seen at Katwa, I have consulted the following publications:—

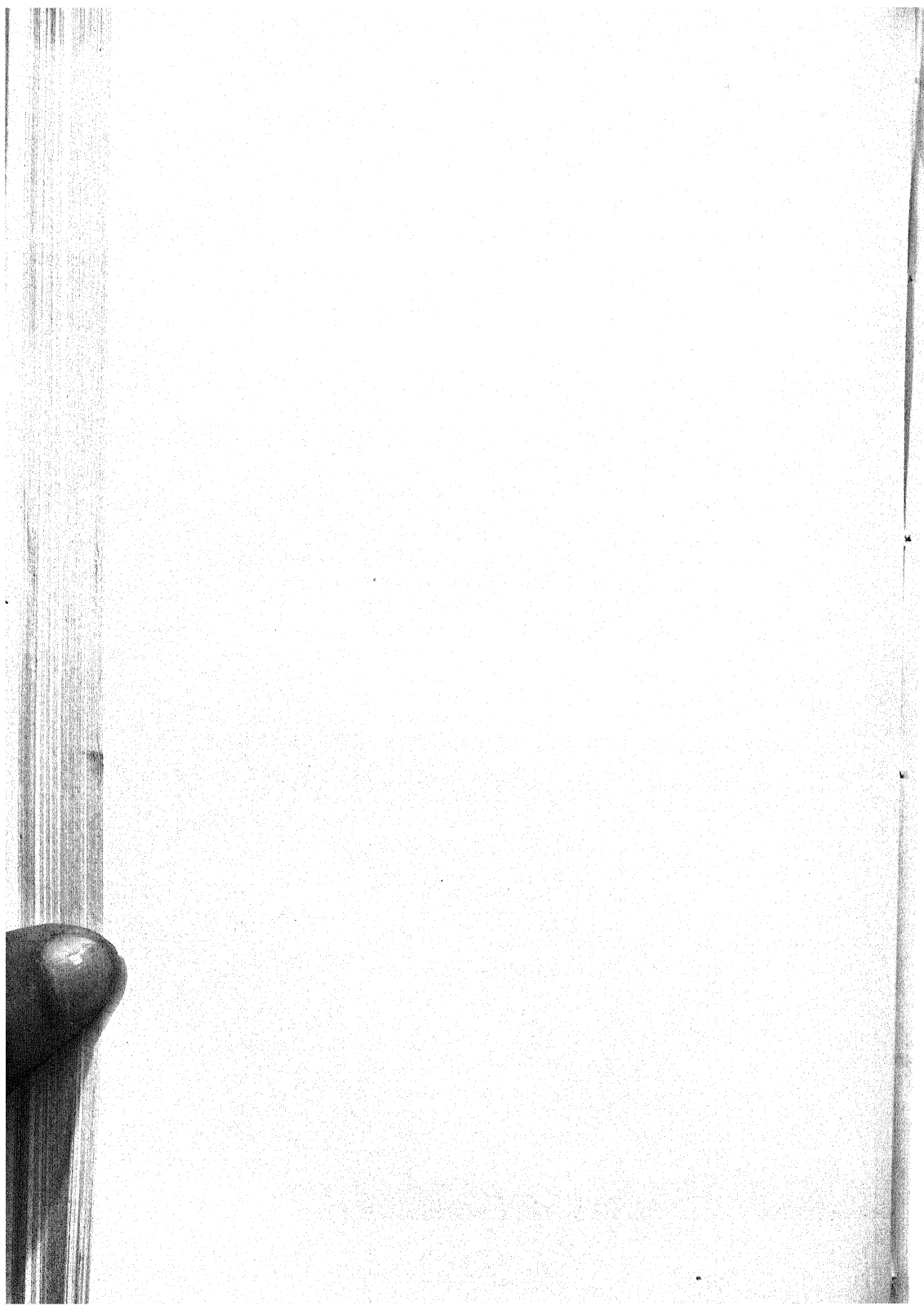
The Banks of the Bhagirathi. By Rev. J. Long, in the Calcutta Review, Vol. VI, for 1846.

The Gazetteer of the Burdwan District (1911).

Hunter's Statistical Account, Burdwan.

Imperial Gazetteers of India.

History of Bengal. By Stewart, etc., etc, etc.



8. Madāran and Mubārak-Manzil, in the District of Hugli.

By MAULAVI 'ĀBDU'L WALĪ.

I. MADĀRAN.

The word Madār is an up-country form of what is called in Bengal 'Mandār' with a nasal *ṇ* at the end of the first syllable; but the form Madāran is entirely up-country and Hindustānī, and as such, it is to be found in Emperor Ākbar's rent-roll included in the *Ain-i-Ākbari*. To spell therefore the word as 'Mandaran,' as has recently been done in the "Hooghly Gazetteer" (1912) and other publications, is not, in my opinion, philologically permissible. Madāran was the name of a Sarkār, and Havēli-Madāran a Mahal or Pargana, and is noted in the *Ain-i-Ākbari* and the Fifth Report of the Parliamentary Select Committee, on the affairs of the East India Company (Madras Reprint, 1884). The place was of great strategical importance, being situated on the Bādshāhī road from Bengal to Orissa. Madāran is situated in the Jahānābād (now Ārāmbāgh) subdivision of the Hugli District. Blochmann has noted in detail the legends connected with Madāran and its patron Saint, Shāh Ismā'il Ghāzī.¹

I visited Madāran from Goghāt on the afternoon of the 11th June 1915, examined the tomb of Shāh Ismā'il Ghāzī in Bhitargarh or "Inner fort," and the inscribed basalt which, according to tradition, contains the history of warfare between the Rajas of Burdwān and Bardah, and other places. The following tradition about the origin of Madāran was narrated to me, which, I believe, contains some substratum of truth. According to this the fort of Madāran was built by Qutlū Khān to check the invasion of Orissa, Madāran being the southern boundary of Bengal Proper. There is a large gate on the south of Madāran, known as "Uria-Mardāna," or Orissa Gate, which divides Bengal from Orissa.² It was Qutlū Khān who, as a ruler of Orissa, constructed the parapet in Madāran, as a temporary measure to check an attack on Orissa. Shāh Ismā'il Ghāzī, a general of Husayn Shāh, King of Gaur, fought a bloody battle with Qutlu Khān, was defeated and beheaded at Madāran, and buried there. To avenge his death, Husayn

¹ Proceedings of the Asiatic Society of Bengal for 1870, pp. 115-120.

² For a considerable time the river Damodar was the boundary between the Kingdoms of Bengal and Orissa, Mednipur with the Ārāmbāgh subdivision of the Hooghly District forming the frontier of the latter Kingdom—Gazetteer of the Midnapur District: Calcutta, 1911, p. 2

Shāh invaded Orissa, but he too was defeated. On hearing this, Mān Singh was sent by Emperor Akbar to Bengal. On the arrival of Mān Singh, a Governor was appointed at Madāran. Mān Singh constructed a road from Burdwan to Mednīpūr which joins with Shīr Shāh's Grand Trunk Road.

The tradition mentioned above supposes that Shāh Ismā'il Ghāzī, said to be the general of Sultan 'Alāu'd-Dīn Husayn Shāh of Bengal, who reigned from 899 to 925 H. = 1493-1518 A.D., was a contemporary and vassal of great Akbar. This can never be true.

There are two tombs, one of Shāh Ismā'il Ghāzī, called *Chhota Āstāna*, and the other on an elevated spot, called *Barā Āstāna*. No one can definitely say whose tomb the latter Āstāna contains. It is surrounded by jungle and consists of terraces, on the highest of which is the tomb. Some say that when Shāh Ismā'il Ghāzī was beheaded, his head was buried at the Barā-Āstāna and his trunk at the Chhota-Āstāna. Others say that Shāh Ismā'il Ghāzī was buried at the Chhota-Āstāna, and the Barā Āstāna contains the remains of another person. It is supposed that Royal treasure was buried there.

According to Lieut.-Colonel Crawford¹ the ruins of the inner fort or Bhitargarh are situated on the south-west bank of the river Amodār, which issues at the northern corner of an extensive ramp, flows across it, passing out a gap in the western side, near its south end. Outside the southern ramp is a narrow tank, which is no doubt the remnant of a moat. The situation was well chosen for defence. The ramp of the "outer part" or Bāhir-garh is some 15 feet high. A little north of the northern fort is Garh Madāran, where I met a few Muḥammadan gentlemen of the place.

The legends of Shāh Ismā'il Ghāzī, the Warrior Saint, are such that I cannot believe them as a whole. But they are universally believed by the young and old of Madāran. This superstitious belief, aggravated by the inability of the people to decipher the *Tughra* writing on a long basalt (2 ft. 4 in. by 1 ft.) loosely fixed in front of the Ghāzī's tomb made it very difficult for me to obtain for a long time a rubbing of the inscription. I was promised that an estampage of the inscription would be sent to me in the course of a couple of days, but no one of the village was willing to get up and take a rubbing through fear that some calamity would befall him. I then requested a Muḥammadan gentleman at Jahānābād (Ārāmbāgh) to procure for me rubbings of the inscription, and also, if possible, copy of the same, which, as I understand, was taken some years ago. The gentleman very kindly supplied me with a copy of the impression taken previously. I studied

¹ Places of Historical Interest in Hughli District, published in "Bengal, Past and Present," Vol. II.

the copy, which according to an educated gentleman of Madāran was quite accurate. Shortly after, I was supplied with the rubbings of the inscription, which were not well taken. I found, however, that the copy and the rubbings did not tally on all points. I requested, again, the gentleman at Ārāmbāgh to get for me better impressions of the inscription. When his men went to the Āstāna, the *Khādim*, as well as everyone of the village, stood in their way, and prevented them from taking impressions of the inscription. They said the shrine was very *garm* (hot), and if any one ventured to get up where the inscribed slab was fixed, Shāh Ismā'il Ghāzi would at once punish him. The matter was put off for several months. At last my friend was enabled to take several rubbings when the Āstāna people were off their guard. I was at the same time informed that the inscription was so defaced that better and more legible rubbings could not be taken. These obstacles did not discourage me. I was determined to see if the extraordinary legend of the "Headless rider of Madāran," as told me and to others, had any real foundation. I requested the gentleman of Madāran, referred to above, to try to decipher the lower part of the inscription, which contained the name and time of the sovereign, in whose reign it was carved. During his stay at home, he tried to decipher it with his naked eye and with glasses, and took rubbings for me. The result is noted below :—

1. The copy of the impression taken previously omits the Qur'ānik verse نصر من الله وفتح قريب وبشر المؤمنين entirely.
2. After copying the Āyātu'l-Kursī, or Throne-verse, the copyist, being apparently unable to account for the remaining passage, conjectured it to be the verses that followed the Throne-verse. So he added from لا اكره up to the words جميع عليهم.
3. The lower part of the inscription is very illegible. The letters are badly cut, and the engraver being in want of sufficient space inscribed the last two lines crookedly.
4. The copy has the following passage at the bottom or end of the impression.

حضرت شاه اسماعيل غازي گنج شکر صابر و شهيد و علاؤ الدين معه
سنة تسعمائة ٩٠٠ هجري قدسي *

I give below the text and translation of the inscription as far as I have been able to decipher it. The reading may be considered as tentative, and an attempt to solve a really difficult problem. The words overlined are doubtful, and the places where I have put dots are undecipherable.

Text.

بسم الله الرحمن الرحيم - نصر من الله وفتح قريب وبشر المؤمنين
 الله لا اله الا هو الحي القيوم لا تأخذه سنة ولا نوم - له ما فى السموات و
 ما فى الارض من ذل الذي يشفع عنده الا باذنه يعلم ما بين ايديهم وما خلفهم
 ولا يحيطون بشي من علمه الا بما شاء وسع كرسيه السموات والارض ولا يؤده
 حفظهما وهو العلي العظيم - بني هذا الباب في عهد سلطان البلاد سيد السادات
 علاء الدين و الدين ابوالمظفر حسين شاه خلد الله ملكه وسلطانه
 بواسطة شاه لار مبارك مورخاً ٩٠٠ تسعماية

Translation.

In the name of God, the merciful and compassionate. Assistance from God and a speedy victory : and do thou bear good tidings to the true believers.

God ! There is no God but He ; the Living, the Eternal ; Slumber seizeth Him not, nor sleep. To Him belongeth whatsoever is in Heaven and in the Earth ! Who is he that can intercede with Him but by His permission ! He knoweth what hath been before them and shall be after them ; and they shall not grasp aught of His knowledge save what he willeth. His Throne comprehendeth the Heavens and the Earth ; and the upholding of both burdeneth Him not ; and He is the High, the Mighty.

This Gate was constructed during the time of the Ruler of the Cities, Chief of Chiefs, 'Alāu'd-Dunyā W'a'd-Dīn Abū'l Muzaffar Husayn Shāh May God perpetuate his Kingdom and sovereignty.

For Shahlar Mubarak, in the year 900 H. (1494-95 A.D.).

It will now be seen that the inscribed basalt could not be intended for an insignificant tomb, but was fixed or intended to be fixed over one of the triumphal Gates of Madāran. The name of the Gate was " ——— Mubarak," the first word, which I could not decipher, commences with the letter *Sh* ش. Whether the basalt was fixed over the *Uṣū-Mardāna*, or Orissa Gate, which has, at present, no inscription, after a victory ; or on the Gateway by which people might enter the fort from the plains below, is not certain. The inscribed basalt, I daresay, was removed by some unscrupulous persons, after it had fallen or been pulled down, from a gateway for which it was

intended, and fixed on the wall of the little building. Tombs of Shāh Ismā'il Ghāzī are numerous. Besides those mentioned by Blochmann, there is one at *Madīna*, only two miles north-west of Madāran itself. There are four such shrines at Kanta Duār and its neighbourhood, in Ghoraghat, described by Mr. G. H. Damant, C.S.¹ According to the legend which Mr. Damant has published, Shāh Ismā'il Ghāzī's head lies buried at Kanta Duār, and his body at Madāran. While I am in favour of collecting legendary and traditionary information, I am at the same time against relying too implicitly on them, without corroborative evidence from other sources.

They say that the tank near Goghāt is called *Farmān-Dighī*, because Shāh Ismā'il Ghāzī, who was superintending the digging of it, received a *farmān* recalling him to court.² This is, in my opinion, against the spirit of the Persian or Hindustānī language. It is so called, I opine, because it was excavated under a Royal *farmān*, or by one bearing that name.

Madāran being a frontier post, well suited for the purpose of defence, it was colonised by a large number of fighting Musalmāns, whose descendants are still to be seen there. Stewart writes that in 1589-90 Raja Mān Singh directed cantonments to be built for the army at Jahānābād on the *Dwarkeswar*; and in order to put a stop to the ravages of the Afghāns, a number of forts had been constructed in different parts of the country.³ I believe that Madāran, being so close to Jahānābād, was one of the places where cantonments were built. Dr. Crawford found that there was no trace of any definite building, even in ruins, at Madāran. If there were any fortification, it was dismantled by the forces of the rival claimants to the throne.

II. MUBARAK-MANZIL.

About two miles south-east of Madāran, there is a place popularly called *Shanbandi* (Persian: *Ṣāhn*, courtyard or platform, built of mortar, bricks or stones) which Professor Blochmann noticed in the Proceedings and Journal of the Asiatic Society of Bengal for 1870 (Vol. XXXIX, Part I). Here, by order of Nawāb Shujā'u'd-Daula Mu'taminu'l-Mulk Āsad Jang, two huge gateways were constructed in 1142 and 1143 H., respectively. The *Riyāzu's-Salāṭin* briefly mentions that Shujā'u'd-Daula was in Orissa as Nāib-i-Diwān, when his father-in-law, the celebrated Murshid Qulī Ja'far Khān, died in Murshidabad. The Emperor Muḥammad Shāh, on the death

¹ Notes on Shah Ismā'il Ghazi with a sketch of the Contents of a Persian Manuscript, entitled "*Risalatush-Shuhada*" found at Kāntā Duār, Raṅgpūr, by G. H. Damant, C.S.—J.A.S.B., Vol. XLIII (1874); Part I, pp. 215-239.

² *Vide* also Proceedings, A.S.B., 1870, p. 118.

³ Stewart's History of Bengal, pp. 182-183.

of Murshid Qulī Khān, conferred the Viceroyalty of Bengal on Āmiru'l-Umarā Khān-i-Daurān (who was the uncle of Khwāja Ānwar-i-Shahid, whose Mausoleum is in Burdwan¹), and Shujā'u'd-Daula was appointed to be the Deputy Governor of Bengal. When Shujā'u'd-Daula reached this side of Mednīpūr, or, as I believe, had crossed Madāran and reached within Bengal and halted at the aforesaid place, the Patent and Robe of Honour arrived.² Shujā'u'd-Daula considered this as a good omen and ordered the place to be named the "Mubarak-Manzil" and a *Katra* and a Caravansarai to be built. The Gateways with inscribed inscriptions in Persian verses still exist, but the *Katra* and market etc. which existed between the two Gateways have long since disappeared.

I have procured correct copies of the inscribed verses and find some material difference in one of them from what has been published in this Journal. The *Qat'ā* on the Northern Gateway, with the exception of the first hemistich of second distich, is correctly published, as also the last hemistich (سرای موطن الملک ملجاء عالم) (the Rest-house of Mu'tamin-ul-Mulk, the Refuge of the World) which gives 1143 H. (1730-31 A.D.) as the date of its construction. The inscription on the Southern Gateway consists of another *Qat'ā* of 9 distiches, of which Blochmann has left out the sixth distich entirely; and the second hemistich of the last distich has been incorrectly copied, with the result that the date of the construction of the Gateway is deduced to be 1136 H. = 1723-24 A.D. instead of 1142 H. = 1729-30 A.D. The date given by Professor Blochmann is some four years before Shujā'u'd-Daula was appointed as Nāib-i-Nāzim of Bengal. It will now be seen from the inscription I publish that while the Southern Gateway was built in 1142 H., the Northern Gateway was built in the following year, in 1143 H. and not after an interval of seven years. The mistake has been continued in the Bengal District Gazetteer of Hooghly (1912), pp. 291-92.

I give below correct Persian texts of both the inscriptions with the translation of the first.

SOUTHERN GATEWAY.

Text.

- 1 بهمد پادشاه خلق پرور محمد شاه شاهنشاه اعظم
- 2 چو نواب اسد جنگ از آدیسه نموده عزم بنگاله مصمم

¹ Vide my paper on the "Antiquities of Burdwan" in the present Volume of this Journal.

² Having received information that Murshid Qulī could not survive long, he appointed Muhammad Taqī Khān to be his representative in

- 3 همین جائیکه دینا ناته نام ست شده با نصرت و اقبال مخیم
 4 برای انظـام صوبۀ بنگ رسید از پیش خاقان حکم محکم
 5 دل و جانها ازین مرثه ببالید جهان شد زین بشارت شاد و خرم
 6 همین جا بهر تعمید سر سرایم بفـرمود آن خداوند مکـرم
 7 مباری منزل این را نام کردند که شد حاصل مراد خاص و عالم
 8 چو شد آباد این جای دل افروز ز بهرشی مصرعۀ تاریخ جستم
 9 بگویم هاتف غیب این ندا داد مبارک منزل و دولت سرا هم

Translation.

1. In the name of the Sovereign, who is the sustainer of the people, Muḥammad Shāh, the mighty Shāhinshāh.

2. When Nawāb Āsad Jang firmly determined to proceed from Orissa to Bengal,

3. Here, at this spot, which is named *Dinanāth*, encamped Victory and Fortune.

4. There arrived, for the Administration of the Province of Bengal, from before the Emperor, firm command.

5. The heart and souls (of all) swelled at this happy news; the world became happy and pleased at these glad tidings.

6. Here at this spot that benevolent Master bade me to construct a Sarāy (building).

7. (And) named this the *Mubarak-Manzil* (Auspicious halting-place), as the special desire and that of the world were fulfilled.

8. When the delightful spot was laid out, I searched a hemistich for its date.

9. An unseen messenger gave me this voice :

"It is an Auspicious Halting-place and also an Abode of Fortune."

The last hemistich of the above verse (No. 9) as published by Blochmann omits the letter (و) whose numerical value is 6, and which being added to 1136 (the Hijri date of the construction of the Gateway according to Blochmann) will give 1142 H. Instead of a *wāo*, Blochmann has put a *kasra* under ل of منزل

I am sure the learned Professor had doubts as to the accuracy

Orissa and quitted Katak, and before he arrived at Murshidābād received, on the same day, news of the Nawab's death and his credentials from Khān Daurān, constituting him Deputy Governor of Bengal and Orissa. He then proceeded to the capital and assumed the duties of his office early in 1139 H. [1725 A.D.]—*Stewart abridged.*

of the *misra* as he had left it untranslated, for without a *wāo* the word *ham* (also), the last word of the hemistich, becomes meaningless.

NORTHERN GATEWAY.

Text.

بامو عالی نواب فیض بخش جهان چو این تکانِ امان شد مرتب و محکم
ز سال فرخ انعام گفت هائف غیب سرای موتمن الملک ملجاء عالم

The word overlined in the first hemistich of the second distich is *itmām* and not *tammām* as published by Blochmann.

According to Professor Blochmann and the people of the neighbourhood of Shan-bandi, whom I consulted, the village has never been called *Dinanāth*. It was a resting-place for wayfarers, and as such might have been called *Dina-nāth* (the friend of the poor), the name of the village being different.

9. The Tōpkhana Mosque at Santipūr.

By MAULAVI 'ABD'UL WALL.

When visiting Santipūr, a considerable town in the District of Nadia, on the 4th September, 1915, I little expected that there could be any ancient building there dedicated for the worship of the Muḥammadans. I found, however, to my surprise that there was a very large population of Muḥammadans—mostly tailors and masons—and at a short distance, a dilapidated Mosque, with an inscribed slab, which had fallen away but is kept inside it. I took an impression of the inscription, which is inserted below. The local Muḥammadans told me that there were formerly there a Tōpkhana and citadel close to the Mosque; but I could see no traces of them. It was the policy of the Mughal Emperors to build forts and moats at a short distance from the capitals of Hindu chiefs and on Trunk Roads and water channels, and to station there a considerable number of soldiers. This I found to be the case at Narāyan-garh, in the District of Mednipur, and in other places. Krishnagar, once the capital of Nadia Rāj, was connected with Santipur by a broad and high causeway.

2. BAKHTYĀR-GHĀT.

There is a ghāt, or steps, to the river Bhāgirathī, which flows beneath Santipūr, called Bakhtyār-Ghāt, so called, it is said, after the conqueror of Nadia, Muḥammad Bakhtyār Khilji.¹ The invasion or raid of Muḥammad Bakhtyār Khilji was done quietly and stealthily without giving rise to suspicion or alarm. Instead of going direct to Nadia or Navadwipa, where the aged Raja then lived, the Khilji marauder took, in all probability, a circuitous route, and landed at, or embarked from, a place since called Bakhtyār-Ghāt. From Santipur, I conjecture, he proceeded to Navadwipa, which was then situated on the Bhagirathi and was almost surrounded by water, and selected a most appropriate hour for attack, viz. the time of afternoon meal. Go where you may, in any of the Bengali villages and towns, you will see that between 1 and 3 p.m. all Bengal and his wife are either bathing, praying, breakfasting or sleeping in their ordinary clothes. I have seen houses of influential landholders and rajās deserted by attendants and servants,

¹ Some say the Ghāt is named after some other person, called Bakhtyār Mandal.

who too go to have their meal or midday siesta at this time of the day. It was at this hour when the aged Raja, after a bath and ablution in the sacred stream and the usual pūja, was having his meal, still in his undress, and no armed attendants about, that the intrepid Turk with his intrepid troopers came up and took possession of the capital. These Tatars and Turkomans did at this instance precisely what they were accustomed to do in their Central Asian raids, the difference, in its result however, being very great. While they might secure a booty of a few hundred heads of cattle in their home raids, here by a single dash they opened for them and their co-religionists a vast field of incalculable activity—politically, socially and religiously. As Clive never dreamed what would be the result of his victory at Plassey, so Malik Bakhtyār never imagined what might be the consequence of his sudden raid. But it is a mistake to suppose that Bengal fell an easy victim to the Muslim inroad. The Bengali fought bravely and tenaciously, as can be seen from the accounts of Pandūa and Mangalkōt, in the District of Hugli and Burdwan respectively, and other places.

3. TRADITIONS.

Santipur has too its traditions. I regret I could not examine Persian documents said to be in the possession of certain Muhammadans. A paper, with the Nād-i-Āli and the names of twelve Imams written on it, which was shown to me, is of no historical value. It is said that a Muhammadan holy man, who had accompanied Humāyūn from Persia to India, requested Akbar that he might be allowed to live in a quiet and secluded place, so that he be not disturbed by the noise and hubbub of political and military discussions. Akbar told him either to select Suragarh (west of the modern Santipūr), or Chāṇḍkuri (now in the Burdwan District). The former place was then garrisoned by 1,300 Pathāns and 900 Rajpūts with means for their provisions, and maintenance. If the holy man, said Akbar, would go to Suragarh, he would be able to live there peacefully and pray for the success of the Imperial army. The holy man came and settled at Suragarh. It is also said that Suragarh was in the Jaigir of Nawab Muẓaffar Khān Shāh 'Ālam. In another document (Panja) the boundary of a Jaigir conferred on Khundkar Kāzim 'Āli is noted thus: South—the Ganga. North—Nirjhar and Bablagram. East—Suragarh. West—Gofiya. The following names show Muslim influence: Pīrhāt, Faqīr-para, and on their east, Tōpkhana, where the old Mosque is situated, Pathān-para and Rajput-pūra. The descendants of the Pathāns and Rajputs are still to be met with at Suragarh.¹

¹ Kartik Charit by Bisvesvar Dās, printed at Santipūr in 1915 A.D.

4. THE MOSQUE.

The Mosque is situated at Tōpkhana in Suragarh or Sutra-garh, the old name of Santipur. The following is the text and translation in English of the inscription :

هو الله	بسم الله الرحمن الرحيم	هو الله
بعد كلشي	لا اله الا الله محمد الرسول الله	قبل كلشي
چراغ و مسجد و محراب و منبر	ابى بكر و عمر و عثمان و حذیر	چراغ و مسجد و محراب و منبر
بعد شهنشاه اورنگ-زيب	بنا كرده مسجد ز صدق و حسيب	بعد شهنشاه اورنگ-زيب
صد و پانزده سال پيش از هزار	پس از هجرت آن سرور نامدار	صد و پانزده سال پيش از هزار
شده يار محمد ز فضل جليل	ز اولاد غ-آزى بن اسمعيل	شده يار محمد ز فضل جليل

Translation.

He is God before all things.	In the name of God, the Merciful, the Compassionate. There is no God but God and Muhammad is the Apostle of God.	He is God after all things.
------------------------------	---	-----------------------------

The candle, the Mosque, the arch and the pulpit.

(Are) Abi-Bakr, 'Omar, Othmān and 'Āli.

During the reign of the Emperor Aurangzib

The Mosque was built in sincerity and calculation

In the year One thousand, one hundred and fifteen.

After the *Hijr* (departure from Mecca to Medina) of that renowned Leader.

Muhammad became the *friend* (Yār) by the favour of God

Who is descended from the *Ghazī*, son of Isma'īl.

The Mosque, as will be seen from the above crude and not very correct verse, was built by 'Yār Muhammad, who was the son of *Ghazī* and grandson of Isma'īl, in the Hijri year 1115 (1702-3 A.D.) during the reign of Emperor Aurangzib (1068-1118 H. = 1658-1707 A.D.) and during the Viceroyalty of Bengal of his grandson Sulṭān 'Āzimush-Shān.

10. Some Traditions about Sultan Alauddin Husain Shah and Notes on some Arabic Inscriptions from Murshidabad.

By G. D. SARKAR, M.A.

Communicated by R. D. BANERJI, M.A.

[With Plates I—VI.]

Many traditions are current in different parts of Bengal about Sultan Alauddin Husain Shah who drove out the depraved Abyssinian usurpers from the throne of Bengal, and restored peace and prosperity to the province in the latter part of the fifteenth century A.D. Husain Shah, son of Saiyad Ashraf, is said to have been a cowherd of a Brahmin before he rose to greatness. His master, who was pious and learned, is said to have foretold his future greatness from an incident connected with a cobra. It is said that once the cowherd was sleeping in the sun, and a great cobra was screening his face with its expanded hood. A similar story is told of the Empress Nūrjahān, immediately after her birth, when Ghiyāṣ Beg was travelling from Persia to India. According to the traditions still current among peasants in the northern part of the Murshidabad district of Bengal, the earlier part of Husain Shah's life seems to have been spent in the village called Chandpara or Ekānī Chandpara which lies close to Sagardighi and Manigram,¹ places claiming considerable antiquity. In this place he is said to have served as a cowherd. His Brahmin master advised him to leave the village for Gaur, where he ultimately succeeded in gaining the throne. After his accession tradition says, the Brahmin went to Gaur and obtained an audience. He went with a cowherd's goad and a tethering rope, which had been left behind, as tokens of remembrance. The Emperor granted to his old master his native village Chandpara, in perpetuity for the nominal revenue of *one anna*. Thence Chandpara is known as *Yakānī* Chandpara in revenue papers.

The Brahmin of these traditions plays a role similar to that of Gangu, a Delhi Brahmin whose name is honourably associated with the founder of the Bahmani dynasty, Sultan Hasan Gangu Bahmani. According to the tradition current at Chandpara, Sultan Hussain is said to have deprived his former employer of his caste at the instigation of his principal Begum. Chaitanya, the celebrated Vaishnava reformer, is said to have granted the

¹ Manigram is also called Munigram by local people. According to the local tradition the name is supposed to have been derived from its association with the hermitage of Garga, a sage who according to Dr. Kern flourished in the 44th year before the Christian era.

Brahmin absolution from a suicidal penance. Another variant of this tradition, about Sultan Alauddin Husain Shah, is current in the district of Jessore. Babu Jogendra Nath Samaddar has recorded this variant, in a Bengali monthly journal 'The Bharati.' In the Jessore variant, the part played by the Brahmin is ascribed to a local noble, named Rājā Rām Chandra Khān, of Benapol, the ruins of whose palace are still pointed out by the local cultivators.

Another account is prevalent in the Murshidabad district (near Sekherdighi and Babargram) about Husain Shah's sojourn at Chandpara which is more in consonance with sober historic verity. According to this story Saiyad Ashraf, Saiyad Yusuf and Saiyad Sharif (Husain Shah) came over to Hindusthan from Tabriz in Persia, and in the course of their wanderings visited Ekāni Chandpara and put up there in the house of the local Kazi. They went thence to Gaur to seek service under the Sultan of Bengal, but being disappointed in their quest returned again to Chandpara. Here at the request of the Kazi, Saiyad Sharif married one of his daughters and through the influence of his father-in-law managed to secure one of the minor appointments in Gaur. Thence by sheer ability he rose to the position of Wazir or Prime Minister, and popular outbreak against the tyrannous Abyssinian Muzaffar Shah II brought him to the throne. It was then that he assumed the title of Sultan 'Ālāuddīn Husāin Shāh. It may be mentioned in this connection that the historian Stewart speaks of Husain Shāh being in a lowly situation in his early days, and also states that he was raised to dignity by the Kazi of Chandpur, who gave him his daughter in marriage.

During my stay in the Jungipur subdivision of the Murshidabad district I succeeded in discovering a number of Arabic inscriptions which, along with the architectural remains already known, connect the early days of Sultan 'Ālāuddīn Husain Shāh more closely with the northern part of the Murshidabad district than any other part of Bengal.

There is a ruined masjid in Ekāni Chandpara, the erection of which is ascribed by the local people to Sultan 'Ālāuddīn Husain Shāh. No inscription has been found here. But there is a big mosque in a neighbouring village, called Kherul or Kherur, which, according to the inscription on it, was erected by a Pathan noble named Rifa't Khān in A.H. 900 = 1494-95 A.D. These two monuments were inspected by the late Dr. Theodor Bloch in 1905. There is another Arabic inscription at Kherur, which has not been properly deciphered, dated 917 or 918 A.H. The big tank called Shekerdighi, at a distance of about four or five miles from Kherur, is said to have been excavated under the orders of 'Ālāuddīn Husain Shāh. An Arabic inscription found close by records that this event took place in the month of Rabi-ul-awwal of the year 921 A.H. = 1515-

16 A.D. In the village of Babargram which adjoins Shekerdighi, there is a tablet recording the erection of a mosque, no longer in existence, by one Malik Sandal (Mandal?), son of Makhdūm Shāh, during the reign of Husain Shāh, on the 12th Rajab of the year 905 A.H. = 1499-1500 A.D. An inscription at Suti, another neighbouring village, refers to the erection of a mosque by the great Khān Muqarrab Khān, son of Chānd Malik, during the reign of Husain Shāh, in the year 909 = 1503-4 A.D. Though from stray inscriptions of this sort no definite conclusion is possible, yet it is evident that this part of the Murshidabad district was a centre of great activity during the earlier years of the reign of Sultan 'Ālāuddīn Husain Shāh. Therefore presumption is in favour of that part of the tradition which connects the early life of Husain Shah with this tract of land.

It is said that Shekerdighi was formerly known as Mantakābād, and a fakir used to live there, when Husain Shāh caused this tank to be excavated in commemoration of his visit to Mecca. It is generally believed in these parts that in order to commemorate his Haj pilgrimage the Sultan caused the erection of mosques and excavation of tanks at the end of every mile from Shekherdighi to Pandua till the series culminated at one end with Shekherdighi tank and at the other end with the great Adina mosque which is said to have been built originally with more than 350 domes. As there is no other tank or mosque on the Badshahi road to confirm this popular belief it can only be regarded as a characteristic popular exaggeration, and may I think be attributed to the goodly number of sacred edifices built during the reign of this king. The local tradition has it that the Sultan's followers met with an unexpected difficulty when proceeding with the excavation of *Shekherdighi* which is said to have been entrusted to a Brahmin. In spite of the great length and width of the tank and its considerable depth no water would come out of it. The phenomenon was attributed to the sorcery of the fakir who was subjected to some harsh treatment and had to remove from the neighbourhood, but in spite of this persecution the tank remained as dry as before. The unsophisticated villagers still believe that the mere touch of a peculiar wand brought by one of the fakir's disciples caused the underground springs to break through their hidden bonds and the tank was filled to the brim. It serves rather to remind one of the alleged feats of modern water-finders with forked branches of witchhazel. The Sultan, it is said, subsequently repented of his previous conduct towards the fakir and on making his acquaintance found out that he was his father's religious preceptor and like himself an inhabitant of Tabriz. The name of the fakir was Sultan Shāh Ābu Saiyad Tabrizi and there are still some persons at Shekherdighi who claim to be his lineal descendants.

The only tradition about any military exploit during Hus-

ain Shāh's reign is rather a curious one and is current at Aurangabad, Nimtita and other villages near Suti Thanah. At old Mangalpur which is only about a couple of miles from Nimtita and 3 or 4 miles from Suti P. S. are to be found some big earthen mounds and traces of masonry with fair indications of what was once a castle moat. These mounds, popularly called the *gadh*, form as it were a circular embankment round a small tank known as *Jiat Kur* which is apparently a corrupted form of the words *Jivat Kunda* or Well of Life. That these ruins are of Hindu origin does not admit of doubt¹ as on the bank of *Jiat Kur* is still to be found a piece of stone sculptured in relief—which appears to have been the lintel of a massive door frame. It is not difficult to make out that the figures in these sculptures are Hindu deities although they have been overlaid through the piety of village dames with more than one coating of vermillion and turned into what can only be described as a sort of minor shrine.¹ According to local opinion these ruins mark the remains of a fortress held by a powerful Rajbanshi chieftain. It is said that on one occasion when the mother of the redoubtable Husain Shāh was being conveyed in a palanquin along the old Bādshāhi road escorted by a retinue of followers, some retainers of the Rajbansi Raja began to jeer at her in allusion to what they believed to have been her former profession.

“*Gauḍa bādshāra mā ekavāra nācan dekhiye jā.*”

“Mother of the King of Gaur
Show us for once
Your skill in dance.”

The lady on reaching the capital reported the incident to her son who at once sent a strong detachment of troops to avenge the wrong. At the approach of Sultan's forces the chieftain with all his people took shelter in the fortress, which he believed to be impregnable, and he successfully resisted the onslaught of the Pathans for a long time as a mere sprinkling of *Jibat Kunda* water was sufficient to bring the dead soldiers back to life. At last the leader of Sultan's forces came to know of this secret and deprived the water of its miraculous property

¹ It may be stated here that not old Mangalpur alone but also Arangabad and its neighbourhood contain relics of past Hindu greatness. At the latter place I came across a piece of enamelled brick like those to be found at Gaur which bore on one side the Sanskrit letter ‘Ah,’ probably a mason's mark. This brick was not long ago in possession of the late Revd. E. M. Wheeler, the then Principal of Krishnath College, Berhampur. I found another Hindu relic at Chhapghatti, the river-side mart of Suti. This is a stone door jamb of a size likely to fit in with the lintel at Jiat Kur and bears a Yaksha or Gana like figure sitting in a crouching posture. The sculpture appears to be of a conventional design as an exact replica of this is to be found I believe in the possession of Varendra Research Society.

by dropping into the tank a piece of beef tied to an arrow. It is said that when leaving her abode on account of this defilement the presiding Genius of this spring of life advised the Raja to abandon the place, and the brave defenders thereupon left the fortress to its fate and took their departure through a secret underground passage; stripped of its supernatural trappings, the plain fact is likely to be that on the only source of water supply becoming polluted through some reason or other, the inmates of the fortress were obliged to make a hurried exit. The story of the underground passage does not appear to be a mere fabrication as there are still some persons alive who saw near the spot a cavity or opening which was obviously the entrance to a tunnel connecting the stronghold with some place outside.

Though tanks with the name of Jivat Kundu are by no means confined to this part of the country and although a similar legend is to be met with in the case of other tanks at Pandua and Mangalkote, the fact that "the great Khan Muqarrab Khan," most likely a Pathan nobleman connected with Hossein Shah's Court, had enough interest in the locality to build a mosque near Suti or Mangalpur, would seem to point to the fact that the place was probably an outpost of the kingdom, and the defeat of the Hindu Chief and the demolition of the fortress was not perhaps a mere mythical affair. It may be stated here that Jangipur was long associated with the Pathans of Bengal. The oldest inscription in the sub-division, discovered by me at Balighata, records the erection of a mosque in 847 A.H. by Ulagh Sarafrāz Khan, apparently a dignitary in the Pathan court, as he is styled 'Khan of Majlis.' (Vide Appendix X). Another fragment of a Hossein Shāhī inscription has also been found at Baliaghātā bearing date 921 A.H. Rabi'-al-awal (= 1515 A.D.). (Vide Appendix V). In conclusion I may mention that there is a noticeable percentage of Rajbanshi population in some of the principal villages near old Mangalpur. There is nothing however in their manners and customs or in their circumstances and social status to indicate that they had once been the members of a powerful ruling clan.

ADDENDUM.

Besides the four Hossein Shah inscriptions mentioned above there is an inscription in Murshidabad City set on the top of the Sadar gate of the palace which refers to Sultan Nasiruddin Shah, King of Gaur (a son of Sultan Hossein Shah) and is dated 936 A.H.¹ I also came across several other inscriptions in the northern part of the district which belong to a much later

¹ This inscription I am informed is now to be found in Basantali Khan's Imambara.

period and do not seem to be of sufficient historical interest. The latest of these is the inscription on Ballighatta mosque erected in 1155 A.H. by one Syed Kashim, said to be a descendant of well-known Mahomedan devotee, Syed Murtuza of Suti. The date can be made out from a chronogram which when translated literally stands as "This is the well-adorned tower of God." The tomb of Shah Hossein Gholam Kaderi which is also situate at Baliaghāta bears an inscription dated 1040 A.H. The inscribed stone on *nawada* mosque near Mirzapur P.S., which is said to have been removed from an older mosque at Paikora, bears a more recent date as it shows that the original structure was built in the reign of Emperor Shahjahan in 1050 A.H. by *Babar Lodi Khan, son of Shaik Husain Lodi*, who is described in the inscription as "Maharaf" or learned in letters.

Syed Murtuza had his astana or hermitage on the bank of the Ganges near Suti where he lived on intimate terms with an old Brahmin lady anchorite named Anandamayī Bhairavi. After their death the two were buried side by side. The site known as Murtuzanand ashram has been washed away by the erosion of the river.

APPENDIX.

NOTE ON NEW ARABIC INSCRIPTIONS FOUND IN THE MURSHIDABAD DISTRICTS.

I. *Inscriptions on big brick mosque at Kheraul.*

The inscription records the erection of this mosque during the reign of 'Alāuddīn Hussain Shāh, son of Sayyid Ashraf-ul Husaini by the great Khān Rif'at Khān in the Hijri year 900—1494-95 A.D.

Text.

قال النبي صلى الله عليه وسلم من بني مسجداً لله بني الله له بيتاً
في الجنة مثله بني هذا المسجد في عهد السلطان المعظم المكرم علاء الدنيا
والدين ابي المظفر حسين شاه السلطان ابن سيد اشرف الحسيني خلد الله
ملكه و سلطانه و بانيه خانمعظم رفعتخان في سنة تسعمائة *

No. II. 2nd inscription found at Kheraul referring to the mosque of Rif'at Khān.

قال الله تعالى ... احد قال النبي صلى الله عليه وسلم من بني
مسجداً بني الله تعالى بيتاً في الجنة هذا المسجد رفعتخان

III. *Inscription found at Babargram.*

The inscription records the erection of this mosque during the reign of 'Alāuddīn Husain Shāh by one Mālik Mandal (San-

dal), son of Makhdūm Shāh, in the year 905 = 1499-1500, on the 11th day of Rajab.

Text.

قال النبي صلى الله عليه وسلم من بني مسجد في الدنيا بني الله
سبعين قصراً له في الجنة في عهد سلطان الزمان علاء الدنيا والدين
ابى المظفر حسين شاه السلطان مسجد بنا كرد ملك (صنديل) ؟ ابن مخدوم
(شاه) ؟ بنا كرده بتاريخ يازدهم رجب سنة خمس و تسعمائة *

IV. Inscription found in a ruined mosque near Suti.

It records the erection of a mosque during the reign of 'Alāuddīn Husain Shāh, son of Sayyid Ashraf-ul-Husaini by the great Khān Muqarrab Khān, son of Chānd Malik, in the year 909 = 1503-4 A.D. There is a verse on the rib which separates the two panels of the inscription.

Text.

قال النبي صلى الله عليه وسلم من بني مسجد لله بني الله له بيتاً
في الجنة مثله في عهد السلطان المعظم المكرم علاء الدنيا والدين
ابى المظفر *
حسين شاه السلطان ابن سيد اشرف الحسيني خلد الله ملكه و سلطانه
بني هذا المسجد الجامع خان معظم مقرب خان ابن چاند ملك في سنة
تسع و تسعمائة *
لا يهدم الله تعالى هذا المسجد الى يوم القيامة *
مجلس خورشيد را عاقبت بخير باد *

V. The fragment of a Husain Shahi inscription found at Balia-ghatta and now in the possession of Maulvi Abul Fazal Saiyad, dated Rabi-al-awal 921 A.H. = 1515 A.D.

سلطنته و ملكه في شهر ربيع الاول سنة احدى و عشرين و تسعمائة *

Translation.

*** his kingdom and dominion [] [the] month of Rabi'-al-awal 921 A.H.

VI. Inscription found near the Sheker Dighi or Sāgar Dighi tank.

It records the excavation of a tank during the reign of 'Alāuddīn Husain Shāh, son of Sayyid 'Ashraf-ul-Husaini, in the month of Rabi-ul-awwal of the year 921 = 1515-16 A.D.

Text.

قال الله تعالى من جاء بالحسنة فله عشر مثقالها بني هذه السقاية
في عهد السلطان المعظم المكرم علاؤ الدنيا والدين *
ابو المظفر حسين شاه السلطان ابن سيد اشرف الحسيني خلد الله ملكه
وسلطانه في شهر ربيع الاول في سنة احدى وعشرين وتسعمائة *

VII. Inscription on a mosque at Nawadah.

It records the erection of a mosque during the reign of Shāhjahān by one Bābar Khān Lodī, son of Shaikh Husain Lodī, in the year 1052—1642-43 A.D.

Text.

لا اله الا الله محمد رسول الله - نصر من الله وفتح قريب وبشر
المؤمنين فالله خير حافظا وهو ارحم الراحمين هذا المسجد بني في عهد
السلطان و (؟) الزمان شاه جهان بادشاه غازي المعروف باسم لودي خان
ابن شيخ حسين لودي في سنة الف اثني وخمسين *

VIII. Inscription on the tomb of Shāh Husain Ghulām Qādirī at Beliaghatta.

The inscription begins with the usual formulae and contains the name of the Saint and the year 1040 A.H. = 1630-31 A.D., which is most probably that of his death.

Text.

بسم الله الرحمن الرحيم
لا اله الا الله محمد رسول الله خدا ايك محمد رسول الله برحق
شاه غلام حسين قادري في سنة الف وست واربعين *

IX. Inscription in a mosque at Baliaghatta.

It records the erection of a mosque by one Sayyid Qāsim in the year 1155 A.H. = 1742 A.D. The inscription is partly in Arabic and partly in Persian. The date of the record is given in the form of a chronogram consisting of the second half of the second line of the Persian verse.

Text.

لا اله الا الله محمد رسول الله - ناد عليا مظهر العجايب تجده عونك
في النوايب - كل هم وغم سينجلي بنبوتك يا محمد بولايتك يا علي يا علي
يا علي *

سید قاسم کہ از صدق و صفا مسجد کعبہ نما کردہ بنا
سال تاریخش بدل گفتم بگو کین مزین قبۃ نور خدا

X. Inscriptions relating to two mosques no longer in existence found at Baliaghatta, Jangipur.

They begin with the usual formulæ and record the erection of two mosques by the great Khan Ulugh Sarfaraz Khan—the Khan Majlis—during the reign of Sultan Mahmud Shah in the month of Ramzan in the year 847 A.H. = 1443 A.D.

Text.

اللہ لا الہ الا هو الحي القيوم - لا تأخذہ سئۃ ولا نوم - لہ
ما فی السموات وما فی الارض - من ذالذی یشفع عنده الا باذنه - یعلم
ما بین یدیہم وما خلفہم ولا یحیطون بشیء من علمہ الا بماشاء - وسیع
کرسیۃ السموات و الارض - ولا یؤدۃ حفظہما وهو العلی العظیم *
بني هذا المسجد فی العهد والزمان ناصر الدنیا والدين ابو المظفر
محمود شاه السلطان بانیہ خان معظم الغ سرفراز خان خان مجلس من شہر
رمضان المبارک من سنۃ سبع و اربعین و ثمانمائۃ *

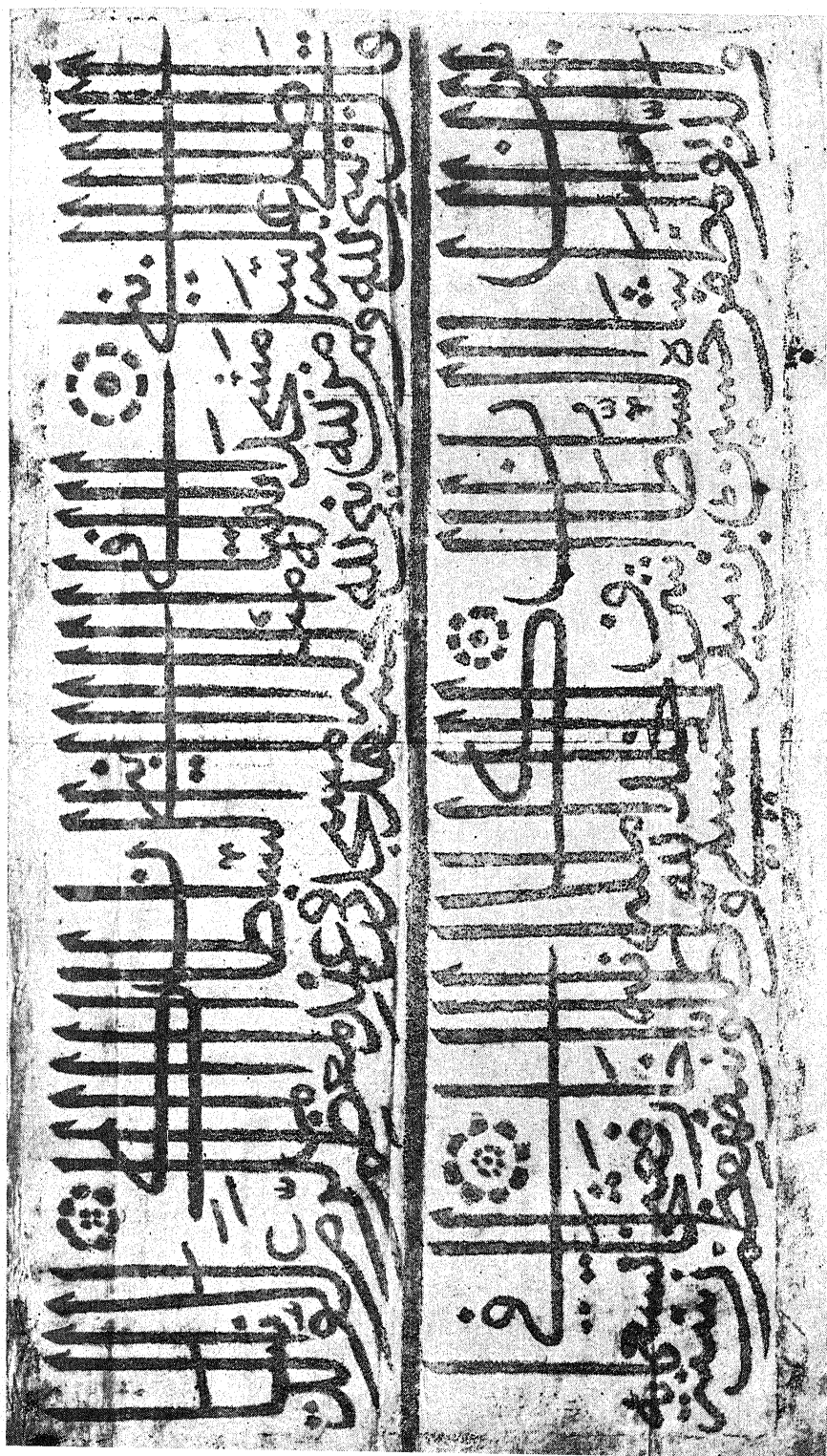
XI. Inscription set on the top of the sudder gate of the palace at Murshidabad.

It records the erection of a gate and contains a reference to Sultan Nāsir-ud-dīn Nasrat Shah, King of Gour, and bears the date 936 Hijri (= 1529-1530 A.D.).

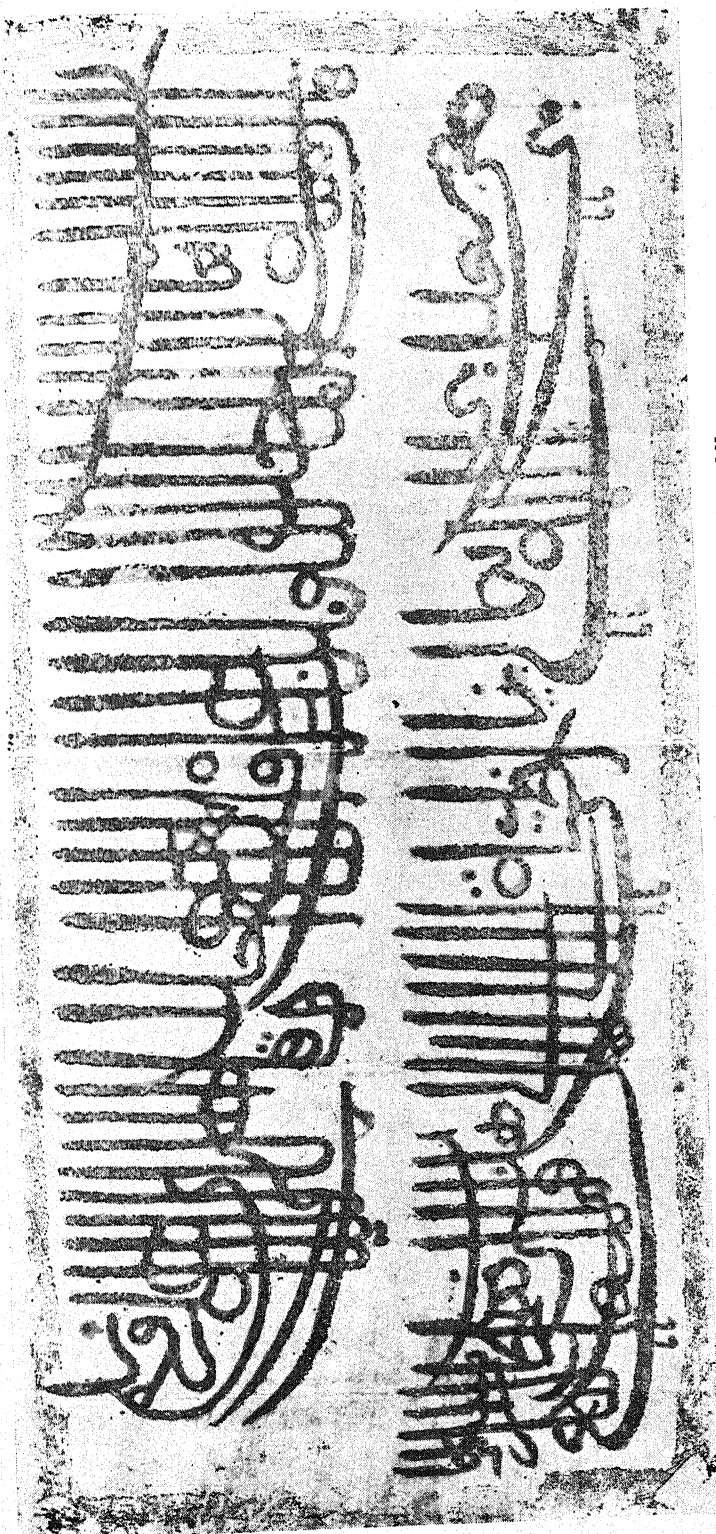
Text.

نمبر ۶ — بنا ہذا الباب السلطان المعظم المکرم السلطان ابن السلطان
ناصر الدنیا والدين ابو المظفر نصرت شاه ابن السلطان حسین شاه السلطان
الحسینی خلد اللہ ملکہ و سلطانہ فی سنۃ ست و ثلاثین و تسعمائۃ *

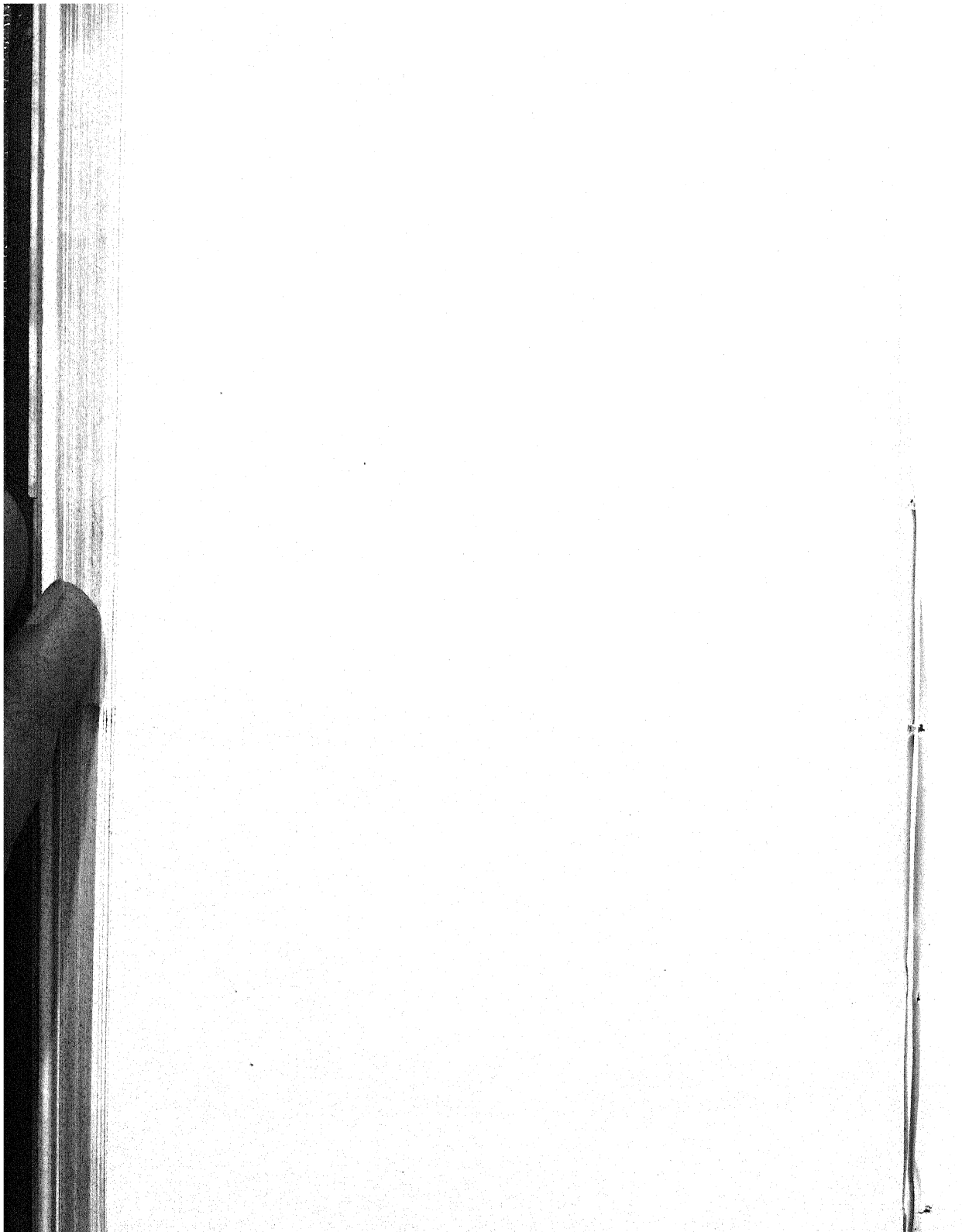


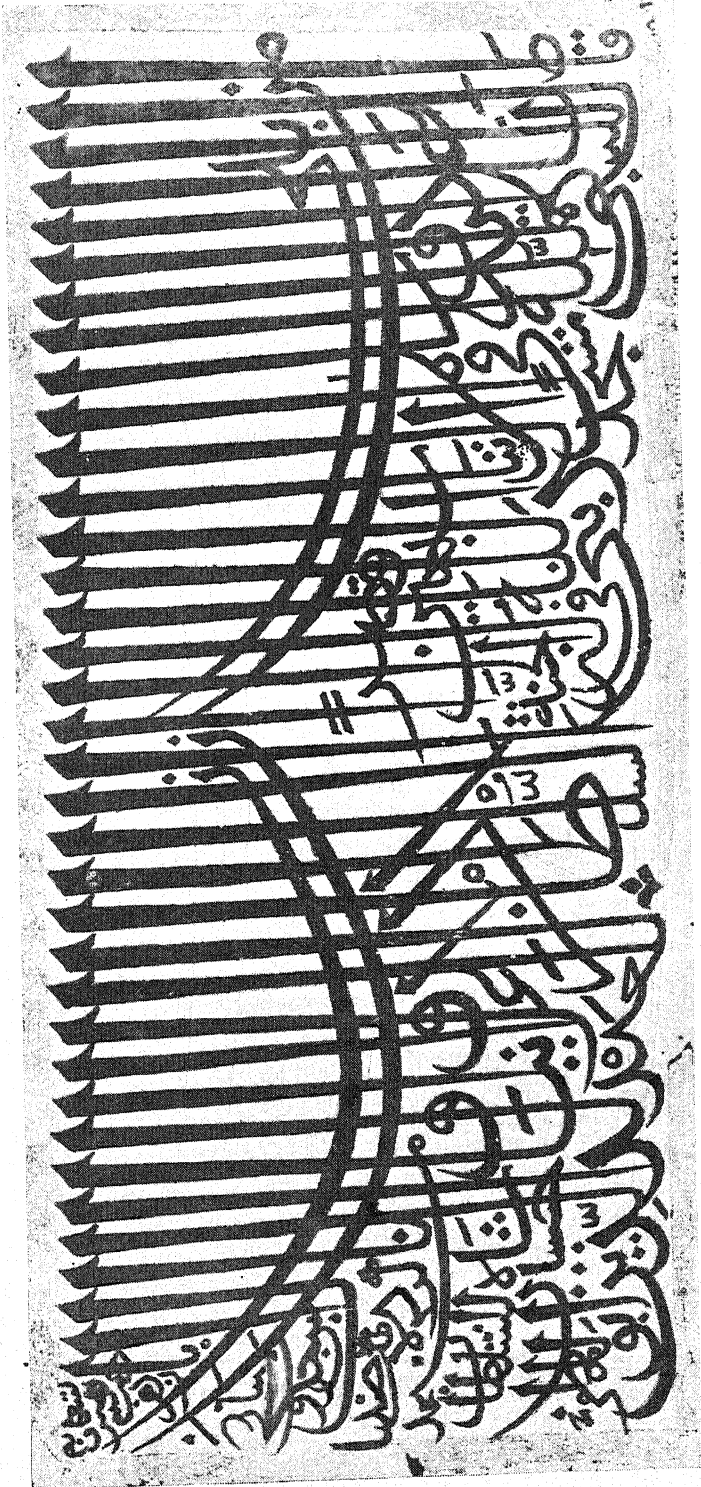


INSCRIPTION OF THE TIME OF ALAUDDIN HUSAIN SHAH FROM KHERAUL A. H. 900.

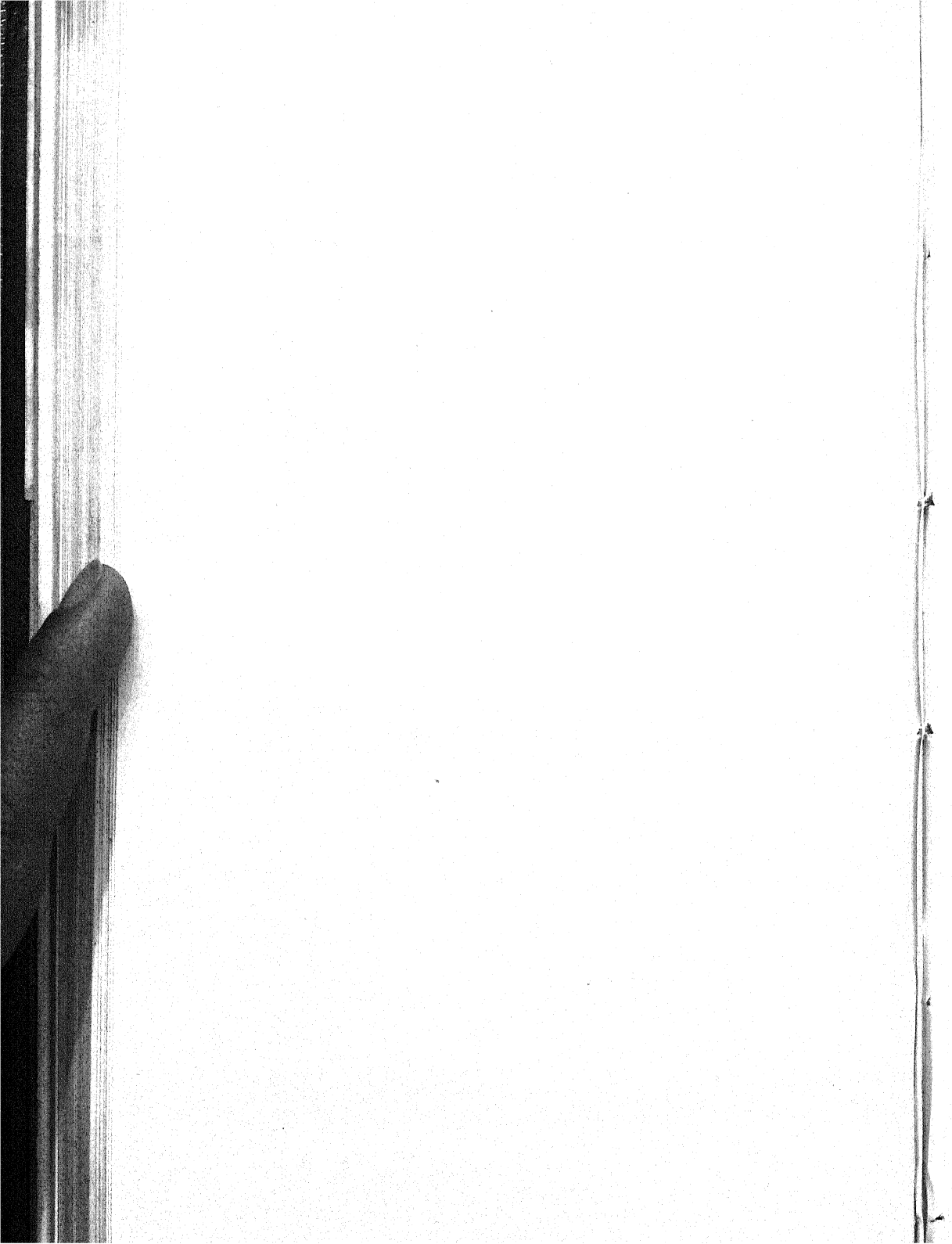


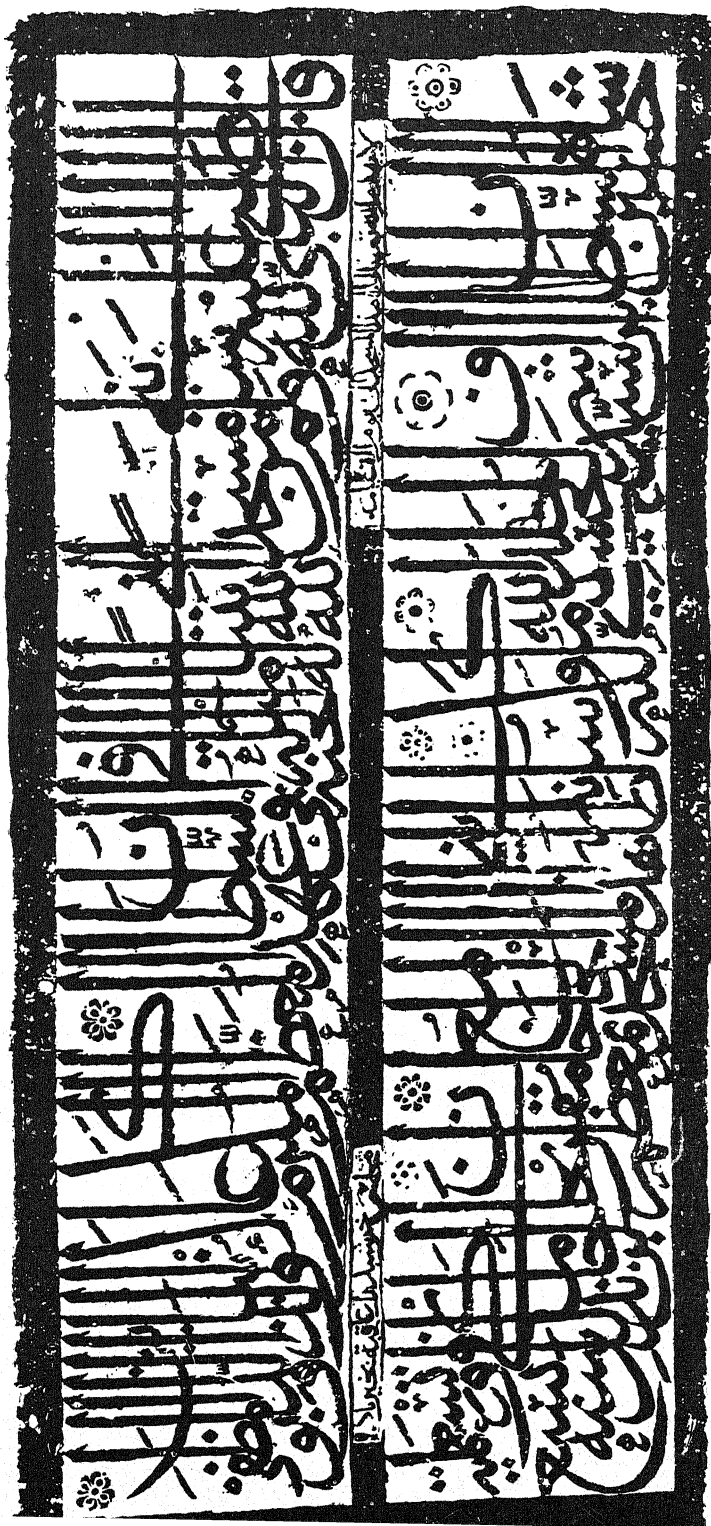
INSCRIPTION OF RIFA'AT KHAN FROM KHERAUL.



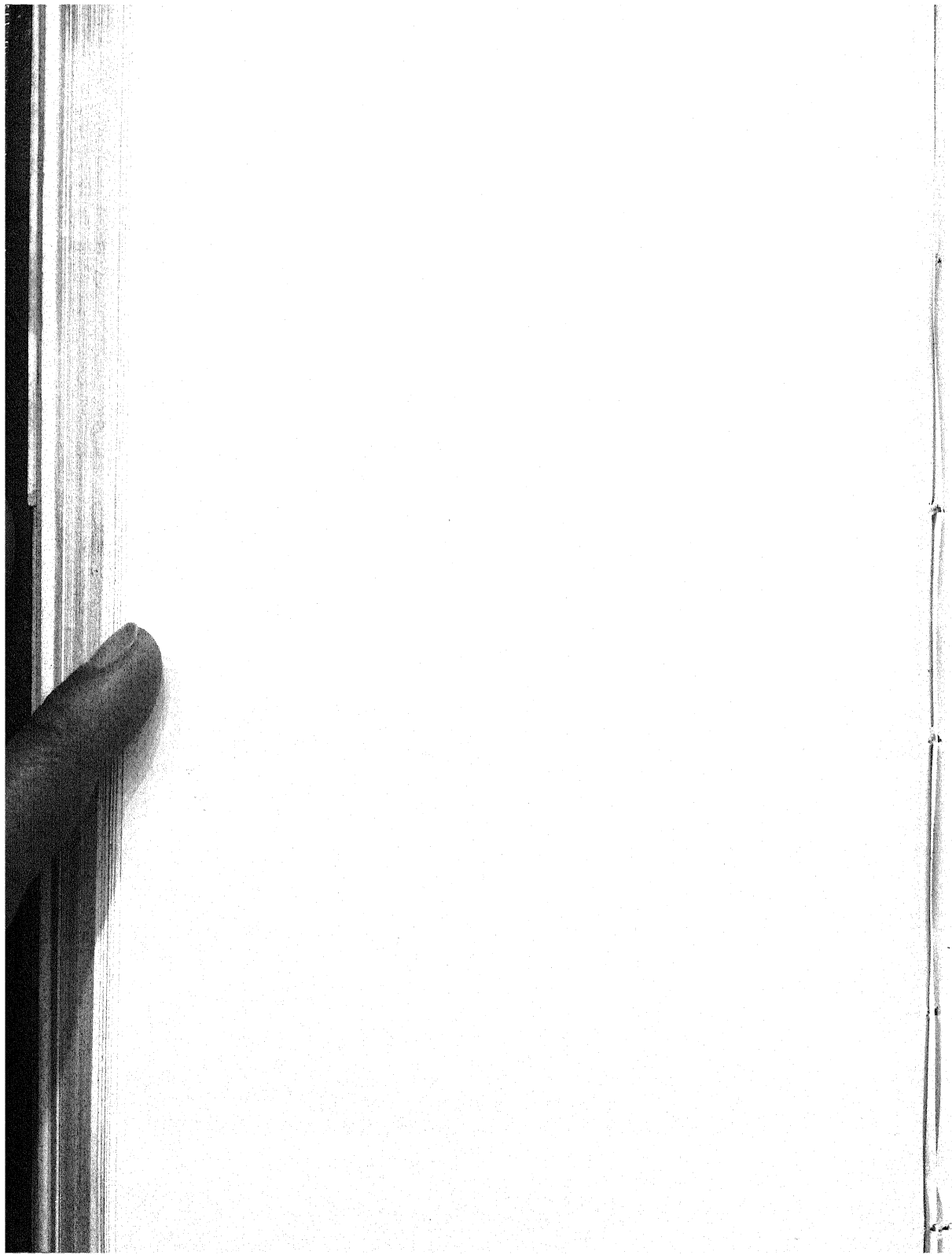


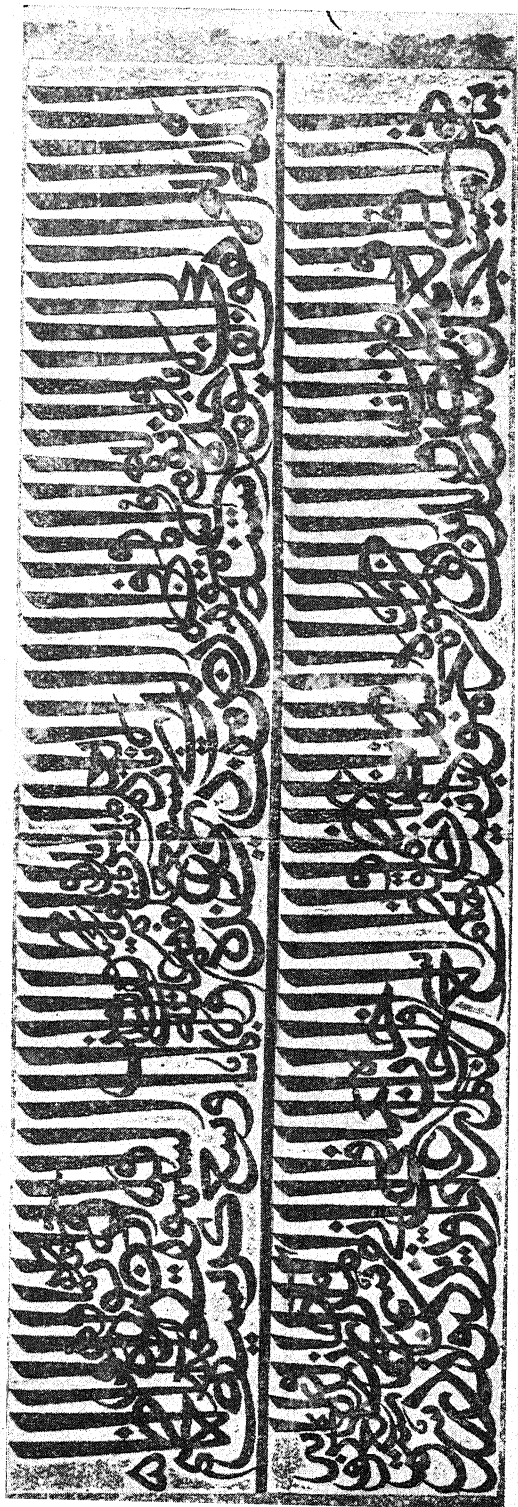
INSCRIPTION OF THE TIME OF ALAUDDIN HUSAIN SHAH FROM BABARGRAM A. H. 905.



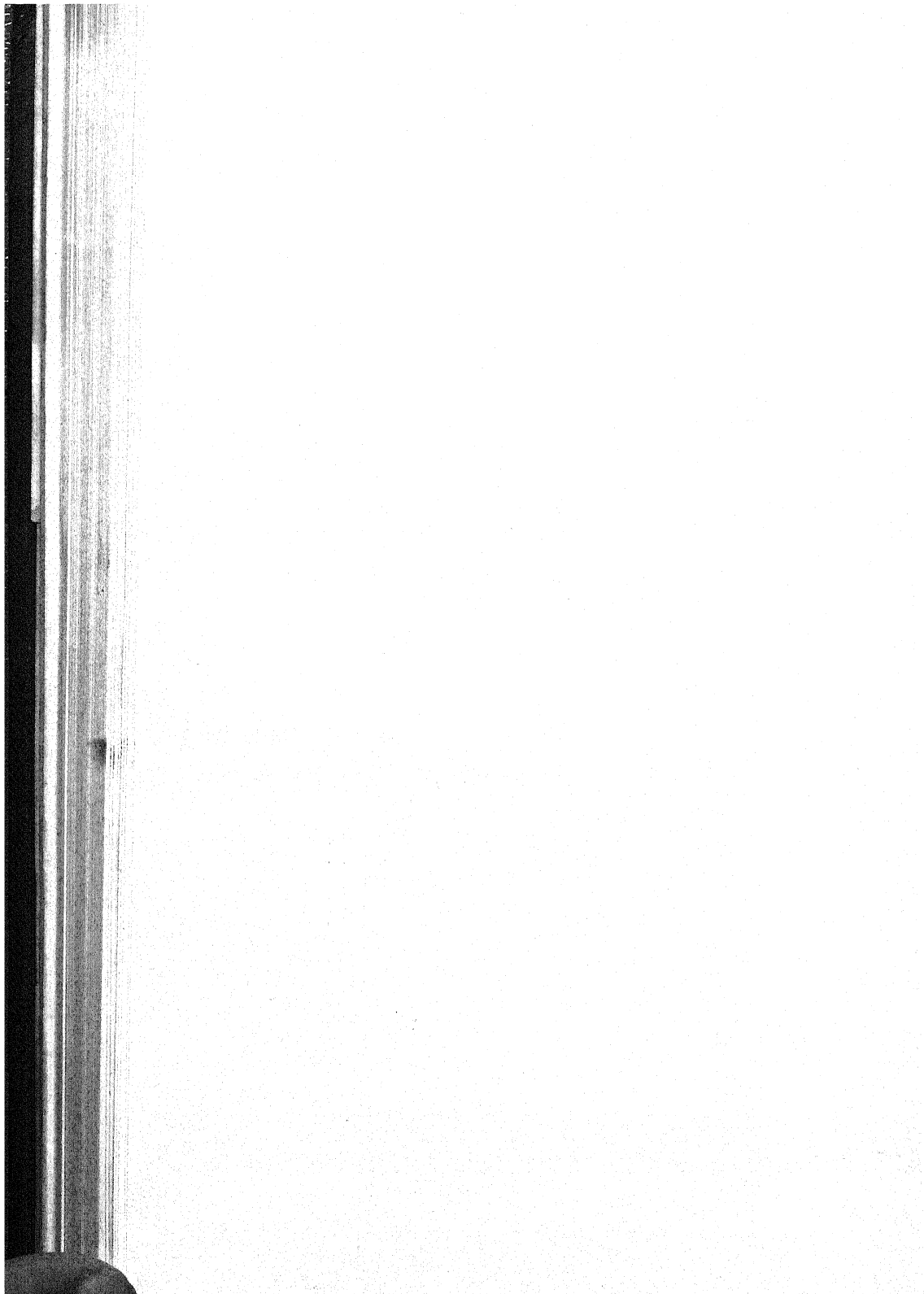


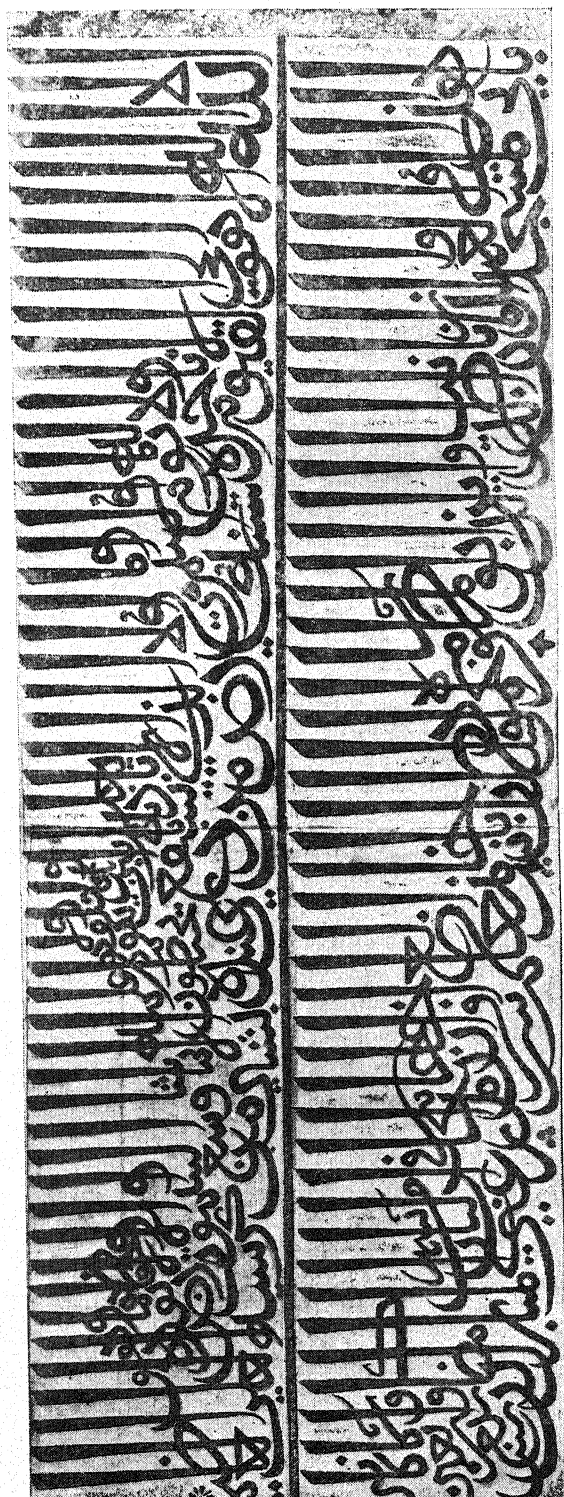
INSCRIPTION OF THE TIME OF ALAUDDIN HUSAIN SHAH FROM SUTI A. H. 909.



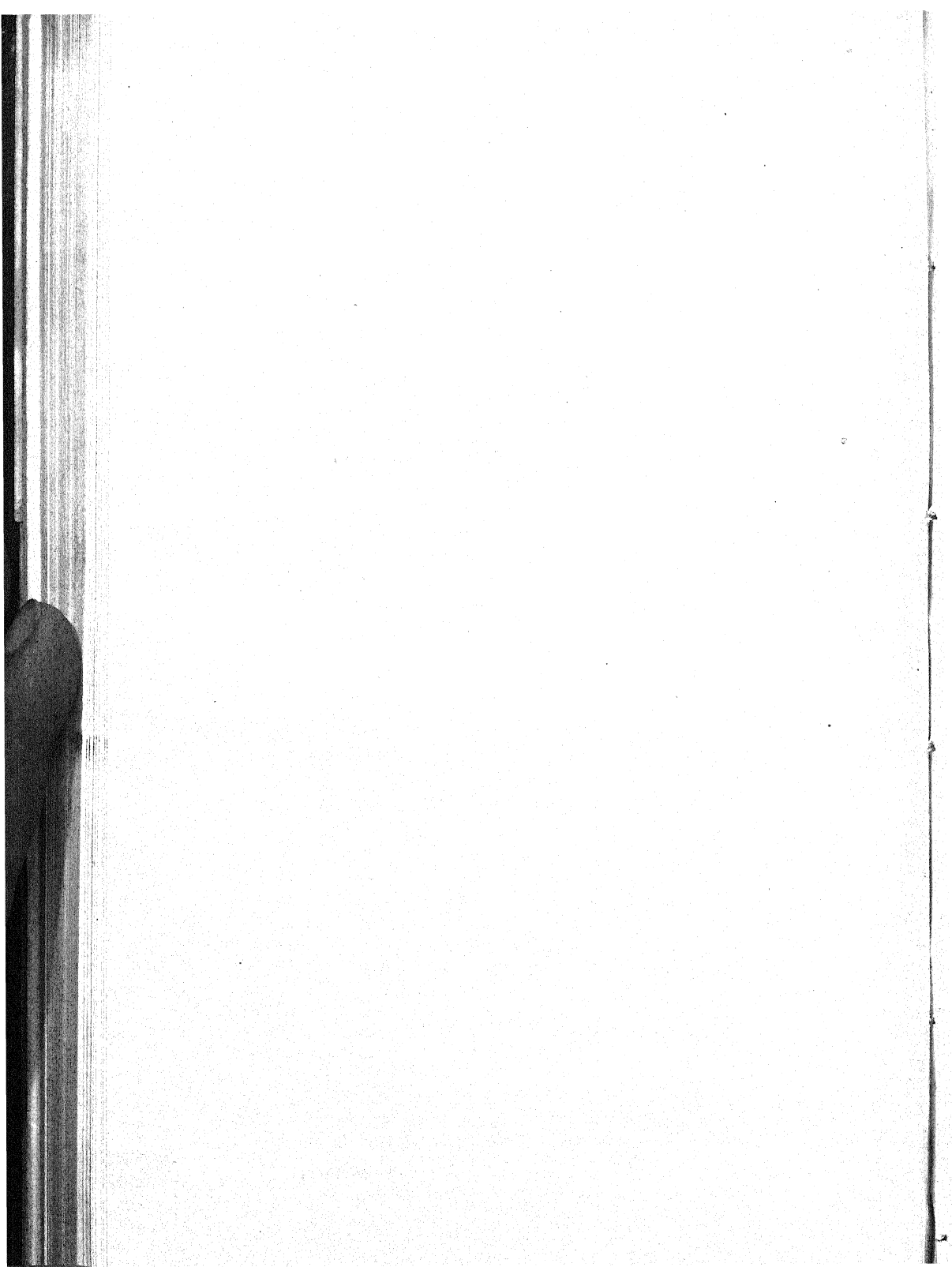


INSCRIPTION OF THE TIME OF NASIRUDDIN MAHMUD SHAH A. H. 847.





INSCRIPTION OF THE TIME OF NASIR-UD-DIN MAHMUD SHAH A. H. 847.



11. NUMISMATIC SUPPLEMENT NO. XXIX.

Note.—The numeration of the articles below is continued from p. 104 of the "Journal and Proceedings" for 1917.

184. NOVELTIES IN GUPTA COINS.

(With Plate VII.)

A few days ago I had a chance of seeing three highly interesting Gupta coins with a dealer of Lucknow, who brought them to me with a view to sell them to the Museum. My offer though quite reasonable was low in his estimation, and as he expected an extravagant value I could not help returning them—of course after taking their casts, which I reproduce below. However I still hope to get them for the Provincial Museum, Lucknow, unless some too liberal a customer turns up to take them away! All are of gold, and at least two of them appear to be unique. The third bears some uncommon features and can very well be treated as a new specimen. I should therefore like to bring them to the notice of numismatists and publish them accordingly.

One of these coins is of Chandragupta II and presents a new variety of the *Couch type*. The remaining two are of Kumāragupta I, one belonging to the *Peacock type* Var. β , while the other is an entirely new variety of the *Lion-slayer type*). With this foreword I now proceed to notice the coins in detail.

(1) CHANDRAGUPTA II.

New variety of Couch type.

Obv.—King facing right, seated on couch in an easy posture after the oriental fashion, having the left leg tucked up with right foot hanging over the couch on which rests his left leg, the left elbow resting on the two pillows or cushions of the high-backed couch. The right fore-arm rests on the knee, the hand holding a lotus-stalk. The object held in the left hand is not clear but looks like a lotus stalk. By the side of the couch under the left foot there is a vessel which I take to be a spittoon.¹

¹ The custom of keeping spittoons is still in vogue in this country, where not only chiefs but all rich people living in the oriental style keep them as a matter of course. To those who are given to betel-chewing, this is an indispensable item in the household furniture.

The marginal legend beginning from the proper left reads—

paramabhāgavata (ma).

The letters on the proper right margin are blurred and defy decipherment. The only *akshara* which can be made out is *ta* followed possibly by a *visarga* of which the lower dot is quite distinct.

Rev.—Lakshmi nimbate, seated on proper right on a lotus, on which the left hand is placed holding a cornucopia. The right hand holds what is possibly a noose or string. Underneath the lotus is a couch or throne of which two legs are visible. Below this is a symbol which I cannot make out. The legend on the left side which is separated by a long line reads—

Vikramādityah.

I know of only two specimens of the *Couch type*, namely, those of the British Museum and the Indian Museum, which have been published and classed as α and β .¹ Both differ from this specimen, which is therefore presumably unique and may be classed as variety γ . That it belongs to Chandragupta II is clear from the reverse legend '*Vikramādityah.*' The legend beginning with *Paramabhāgavata* is to be seen on the *Horseman type* of his coins.²

This piece resembles more or less the *Lyrical type* of Samudragupta coins and may have been modelled on it.

KUMĀRAGUPTA I.

Peacock type.

Var. β .

Obv.—King nimbate, standing left stooping slightly, with left leg crossing the right, which is bent at the knee, wearing waist cloth and jewellery, his left hand resting on hip and right hand apparently feeding the peacock which stands on the right side facing the king.

The legend on the right side reads :—

*Jayati svagunairgunarās(ih).*³

On the left margin I find clear traces of eleven *aksharas* extending from the foot of the peacock to the nimbus of the

¹ Allen, *Coins of the Gupta Dynasty*, p. 33, Plate VI. 8. V. Smith, *Catalogue of the Coins in the Indian Museum*, Calcutta, Vol. I, p. 104, Plate XV. 10. J.A.S.B., 1834, p. 179, Pl. II. 13. *Journal Royal Asiatic Society*, 1839, p. 76, Pl. I. 13.

² See Allen, *Coins of the Gupta Dynasty*, p. 45.

³ Allen, *Cat. of Gupta Dynasty*, pp. 84-86.

king. Of these the last four, especially the 8th and the 9th which read *nāra* and *Ku*,¹ may be read with some certainty as *nḍrakumāra(h)*. This suggests the reading of the two preceding letters as *mahe*; thus giving the full name of the king, viz. *mahēndrakumāra*. The first letter on this side seems to read *śa* and the second perhaps stands for *tru*. If these two symbols really read *śatru*, the next word cannot but be one which means destroyer or the like. The adjective like *nishūdi* or *nihantr* can well fit in: this tentative reading giving us one half of a verse in the Vegavati metre.

Rev.—Kārtikeya riding his peacock facing to front holding spear in left hand over shoulder, with right hand probably sprinkling incense on altar; the peacock stands on a kind of platform; border of dots.

Legend to right reads—

Mahendrakumāra(h).

This piece exhibits two novelties on account of which the coin may claim to be unique. One is the reduplication of the symbol for *gu* in the epithet *guṇarāsiḥ* in accordance with Pāṇini's aphorism अचोरचायां द्वे² and the other is the position of the legs of the king which is different from that seen on all the coins of this type of Kumāragupta I which have been so far brought to light.

Lion-slayer type.

New Variety.

Obv.—King holding goad or *aṅkuśa* in right hand is seated on elephant which advances right and tramples a lion under his left foot; behind him is seated an attendant holding a *chhatra* over him. Several indistinct letters are to be seen on the margin. Of these six or seven appear to be more or less complete. Beginning from above the head of the elephant I would read *ksha(kshī) ta (ti) sa (śva) ra*. *kaka*.

Rev.—Goddess nimbate, wearing long robes standing left, holding lotus? with stalk in left hand which rests on the waist, the right hand is extended upwards as if feeding the peacock who stands to the right with beak touching the hand. Border of dots. No symbol.

Legend commencing from above the right hand of the goddess reads—

Siṅhanihantā mahendrā(dityaḥ).

Altogether I find traces of ten symbols, three on the right and seven on the left side of the goddess. Of these eight are

¹ A specimen, No. 255, noticed by Mr. Allen also gives symbols for *kumāra*.

² Pāṇini viii. 4-46.

pretty clear and can be made out with certainty. The *aksharas* just after the symbol for *ndra* or *ndrā* are indistinct, but on the strength of what precedes them I think they can not be anything else but symbols for *ditya(h)*. They could perhaps stand for *Kumā(rah)*, but their shape will hardly admit of the latter reading. In either case the legend is, I believe, quite new, as is the coin which bears it. This I call a new variety of the *Lion-slayer*, and not *Elephant-rider* type because of the epithet *Sinhanihantā* found in the legend, and owing to the fact that a lion is trampled to death on the obverse side. Mr. Allen in his excellent catalogue has shown five varieties of the *Lion-slayer* type of the coins of Kumārgupta I. In all of them the king shoots the lion while standing, as is the case with the *Tiger-slayer* types; but here he kills it by the elephant he is riding. The reverse of this coin, excepting the legend, is that of the *Tiger-slayer* type, and omitting the trampling of the lion the obverse is like that of the *Elephant-rider* type.¹

HIRANANDA ŚĀSTRĪ.

Lucknow :

The 30th October, 1916.

185. THREE INTERESTING SĀSSĀNIAN DRACHMES.

[With Plate VIII.]

Of the three drachmes described below, one is of Kobād I and is of special interest in that it bears no legend on the obverse and no date but only the mint on the reverse. The others are of Hormazd IV, one having on the reverse the date and the mint in changed positions contrary to the established usage, while the other is dated in his thirteenth regnal year.

Kobād I, nephew and successor of Balāsh (484-488) and son of Firōz I (459-484), was not disposed to be the humble servant of the priests and nobles to whom he owed the crown, and to humiliate them he played the dangerous game of encouraging Mazdak, the energetic priest of a new religion, which demanded in the name of justice that he who had a superfluity of goods and several wives should impart to those who had none. This theory was actually put in practice to some considerable extent, but then the nobility and clergy rose, deposed Kobād, and imprisoned him in the "Castle of Oblivion" (identified by Sir H. Rawlinson as Gilgerd in northern Susiana), placing his brother Jāmāsp on the throne in 497. Kobād, however, escaped to the Hephthalites, where he had once lived as a hostage,

¹ The only known specimen of the *Elephant-rider* type of Kumārgupta I is preserved in the Indian Museum Calcutta. (See Allen's Catalogue, page 88.)

received in marriage the daughter of the king, and with his help expelled Jāmāsp and recovered his kingdom in 499.

Kobād died, eighty-two years old, 13th September 531, and was succeeded by his destined heir, Khusrau I, surnamed Anōsharvān "the Blessed", whom his father is said to have caused to be crowned as he lay on his deathbed.

Kobād or Kabād is the Avestic word Kawāta "found on the gate" (see the Bundelesh, Translation, West, 1880, p. 136). It is Qobād according to the Arabic orthography and in Greek *Καβατης*, *Καβαδης*, *Κοβιδης*, etc. (See Justi, *Iranisches Namenbuch*, p. 159).

On his coins we find *Kavāt* and rarely *Kavād*, amplified from his sixteenth year by the word *afzū'nē'* (from *afzū'nē'k* "excellent") which is sometimes found abridged as *afzū* and *af*. Kobād is the only king who has this word associated with his name. On the coins of his successors *afzū'n* or *afzū't* is always separate and inscribed on the other side of the field. During his first reign, we find on the reverse his name *Kavāt* with the indication of the city of issue.

Although there were some exceptions during the reign of Firōz I, the usage of marking the regnal year on the drachmes was not established till the reign of Jāmāsp in 497. Thereafter the date is inscribed in the field on the reverse to the left, the right being reserved for the mint-monogram. This usage became a definite convention which endured till the end of the Sāssānian dynasty. It was maintained by the Arabs in their copies of the Sāssānian drachme, struck in the course of the seventh and eighth centuries of the Christian era, and the Ispehbeds of Tabaristān followed the same usage on their coinage.

With his restoration to the throne, Kobād adopted from his predecessors the practice of dating his coins. The earliest certain date is of the year 11 (*iājdeh*) which corresponds with 499: for the reading *aioki* (one) mentioned by Dorn was disputed with reason by Bartholomaei (*Mélanges asiatiques*, April 1859, p. 613). The last date is of the year 43 (*se chehel*), which is the year 531, the series between these two dates being complete.

The mint-monograms did not appear on the drachmes of the early monarchs till the reign of Bahrām IV (388-399). During the time of this king and his successors Yezdegerd I (399-420) and Bahrām V (420-438), the monograms, which are composed of a few letters only, were inscribed on the right and left or on both sides of the fire surmounting the altar on the reverse side of the drachmes. Under Yezdegerd II (438-457) the monograms passed into the field on the right and were regularly confined to that place.

From the year 13 during the second reign (499-531) of Kobād I, the Sāssānian coinage is enriched with the marginal

addition of crescents and stars, the conjunction of Venus and the Moon, the emblem of felicity in ancient Erān.

Description of the first drachme.

Metal.—Silver.	Date.—Nil.
Weight.—61 grains.	Mint.—BST (Bost).
Diameter.—1.15 inches.	

PN

BST (Bost).

Obverse.—Bust of king to right, with a very short beard, wearing an embattled crown, surmounted by a crescent with the traditional Sāssānian globe, having a fillet floating on each side. A crescent on the forepart of the crown and a star behind it. Hair brought back in ringlets. A crescent over each shoulder and a fillet floating beside it. In front of the nose a pair of crescents and a star above them. Dress and necklace with three pendant pearls. The whole device enclosed in a grēnetis with three crescents and stars on the margin.

Reverse.—An altar adorned with bands, surmounted by the fire with two attendants. A star to the left and a crescent to the right of the fire. In the field to the left two letters which may be read PN from the outside of the piece, and to the right the mint-monogram BST. The whole device enclosed in a grēnetis.

There is no legend on the obverse, a very unusual occurrence on a Sāssānian drachme. It will be seen from the crown and the design of the reverse that the coin is of Kobād I in his second reign. The two letters PN to the left on the reverse may perhaps be the commencement of the date, either *panch' vīst* (25)* or *panch' sīh* (35), since they occupy the place of the date. They certainly do not represent *panch' deh* (15), because the coin manifestly belongs to the later part of his second reign and the star in front of the head was introduced about the year twenty. I am somewhat inclined to regard the letters as the commencement of *panch' sīh* (35) since the drachme of this year figured in Dorn (Pl. XXI, fig. 47) resembles very closely the coin under review, also issued from the same mint, and without any legend on the obverse.

The mint-monogram BST represents the town of Bost بوسْت which is thus written in full. From the position which it occupies on the coin, this monogram cannot be confounded as a faulty inscription of the number twenty, *bist*, which is always written *vīst* on the coins.

Mordtmann (Z.D.M.G., 1879, p. 128, no. 63) read this monogram BST and identified it with the town of Bost in Segistān (Seistān). He found it only on the drachmes of Kobād I, years 35 (523) and 41 (529), and Khusrau I, year 12 (542).

De Morgan (Revue Numismatique, 1913, p. 335, § 57) thinks that the last letter O is only a deformation of *io* and that this monogram represents Bost. He finds it only in 523 (year 35 of Kobād I).

I am of opinion that the last ligature is not a letter at all, but a mark representing a full-stop, to show that the name Bost is written full in all its letters.

"According to Ebn Haukal and other writers, it is one of the principal cities in the province of Seistān. It is the Abeste of Pliny. It was founded by Bastur, the Bastavairi of the Avesta and the Nastur of the Shāhnāme. It is said to have been founded at the time when King Gushtāsp had gone to Seistān, to be a guest of Rustam, and to propagate the Zoroastrian religion there, a short time before his second war with Arjāsp." (Shatrōihā-i-Airān, in the Asiatic Papers, p. 173, by Dr. J. J. Modi).

The second coin was struck by Hormazd IV and has on the reverse the mint to the left and the date to the right in defiance of the established custom noted above.

Hormazd IV, who ascended the throne in February 579, was the son of Khusrau I by the Turkish princess, and on this account he is surnamed Turkzādeh "son of the Turk." He was deposed and soon after put to death in the summer of 590.

Hormazd (Hormisdas, Ōrmazd, etc.) is the abridged form of Ahuramazda, Zend, Ahura "Creator" and Mazda "Omniscient." The name is written in Pahlavi, with the transposition of h, Aūharmazdī. The Greek form Ὀρμίδας implies that the pronunciation was Hormizd. (See Justi, Namenbuch, p. 7).

On his coins we find his name Aūharmazī or Aūharmaz accompanied by *afzū* or *afzūn*.

Description of the second drachme.

Metal.—Silver.	Date.—Shatā (six).
Weight.—57 grains.	Mint.—ZUZN (Zuzen).
Diameter.—1.20 inches.	

• H H ZUZN (Zuzen).

— SHTA (Shatā).

Obverse.—Bust of king to right, wearing a high tiara, surmounted by the traditional globe. The hair brought back

in curls and a short beard. Dress and necklace. Over each shoulder a Sāsānian fillet floating. In front of the crown, a crescent and star, and behind it, a star.

Legend.—In front of the face, *Aūharmazī* (very much defaced owing to the deep impression on the reverse), and behind the head *afzū'n*.

Aūharmazī afzū'n "Long live Hormazd."

Grēnetis and outside it on the margin three crescents and stars.

Reverse.—An altar, adorned with bands, surmounted by the fire, having two attendants. A crescent to the right and a star to the left of the fire.

Legend.—To the left in the field the mint ZUZN and to the right the date *shatā* (six).

Grēnetis.

The peculiarity of this drachme is that on the reverse the mint is engraved in place of the date and *vice versa*. As far as I am aware this is the sole recorded instance of such a departure from the prevailing practice. In the drachme figured by Dorn (Pl. XXVI, fig. 12) the apparent change is due to the perversion of the design on the reverse, as the result of faulty die-sinking. When seen in a mirror the whole reverse presents no unusual feature.

De Morgan (Rev. Num., p. 507, no. 177) cites this mint-monogram as unique in 590, and gives the reading GUGU as very doubtful. He is unable to recall the name of any town answering to this reading.

Mordtmann (Z.D.M.G., 1854, p. 23, no. 44, Pl. IV, no. 51; and 1879, p. 124, no. 36) reads another monogram, similar to this but having a vertical stroke at the end instead of the dot, ZUZNU and identifies it with the town of Zuzen in Khorāsān. De Morgan (p. 507, no. 75) reads it GUGUN without any identification. There is also another monogram similar but having two vertical strokes at the end. I am of opinion that these strokes are nothing but a full-stop. In the monogram on my coin there is a dot, which is also intended to show that the name is written in full with all its letters, as in the case of Bost, already noted.

The vertical stroke is either an O or an U and corresponds with the optional O which in MS. Pahlavi is found following b, p, t, ch, k, n and g, either in the body or at the end of words. Even the oldest MSS. fail to observe any uniformity as regards this redundant O, but insert or omit it indiscriminately. This seems to show that O though inserted at a very early date was not pronounced.

That the reading of Mordtmann is correct is substantiated by the similarity of the two letters ZU in the word *afzūn* or *afzūt* figured on the obverse of the later Sāsānian drachmes. It is equally certain that the first as well as the third letter is

an Z and not a G. De Morgan is very cautious in accepting the reading of Mordtmann and remarks that it seems preferable to refrain from all interpretations until we possess a great number of coins or till one of these monograms is found in another epoch, permitting us to fix the value of the first sign.

I read the monogram ZUZN on this coin and identify it with the town of Zuzen after Mordtmann. "زُوزَن" Zewzen (also pronounced Zuzen) is a town and vast canton between Nishāpūr and Herat. It was dependent ordinarily on the province of Nishāpūr. It was surnamed 'Little Basrah' on account of its producing many doctors, savants and learned men.

The name Zuzen was given in the following circumstances. When the Magi transported the fire which they adored in Azerbaijan to Seistān, the camel which carried it, arrived on the site of this actual town, knelt down and refused to rise again. Its conductor then said to it, *zud zen* (زود زن), that is to say, haste thee (عجل), but the animal did not move, even when cajoled and struck. It is in remembrance of this portent that a temple of fire was erected on that spot and was given this name." (Barbier de Meynard, *Dictionnaire géographique, historique et littéraire de la Perse*, etc., p. 290).

Description of the third drachme.

Metal.—Silver. Date.—Sij deh (thirteen).
Weight.—59 grains. Mint.—RD (Hekatompylos).
Diameter.—1.20 inches.

Aūharmazī afzūn.

SIJ DH.
(Sij deh).

RD (Hekatompylos).

This coin is also of Hormazd IV and the description is almost the same as the last.

Hormazd IV came to the throne in February 579 and as was customary he reckoned his first regnal year from the last New Year's day, which fell on 30th June 578. According to Noeldeke, he was deposed and killed in the summer of 590. It appears that these events took place soon after he entered his

thirteenth regnal year on 27th June 590, as can be proved from the coins of Khusrau II, Bahrām Chōbin and Bistām. They reckoned the commencement of their first regnal year from 27th June 590. That shows that the deposition and the death of Hormazd IV took place after the year had changed, otherwise they would have reckoned even the few days preceding the new year as their first regnal year.

It must have taken some time for the news of the events in Ctesiphon, the capital, to reach distant Hekatompilos, and in the meantime coins were struck and issued in the name of Hormazd IV bearing the year 13. (See what is said by Gutschmid, Z.D.M.G., 1880, p. 746).

Mordtmann (Z.D.M.G., 1880, p. 126) mentions an unique piece in his collection dated in the year 13 (*siḥ deh*) of Hormazd IV. He says: "Till now no other specimen is known of the year 13. The letters are accurate and distinct and particularly the year 13 is undoubtedly entire; it is written *siḥ deh*." Such is the case with the coin now described.

Mordtmann's coin was struck at Gondishāpūr, the city between Dizful (Lat. 32° 22' N, Long. 48° 27' E) and Shushter (Lat. 32° 3' N, Long. 48° 53' E) whose ruins are now known as Jundishāpūr. It was founded by Shāpūr I and Khusrau I instituted there a university specially for the study of medicine.

جندی شاپور Jondi Shapour, or گندی شاپور Gondi Shapour, is a considerable city, populous and pleasant, abounding in dates and the produce of agriculture." (Ouseley, Ibn Haukal, p. 77).

Drouin (Les légendes des monnaies Sassanides, p. 49) speaks of a piece of Khusrau II of the year 39 (*nūj sīh*) in the Hermitage Museum, struck at Dārābgerd. There is another in the Bartholomaei collection (Pl. XXX, fig. 43) struck at Meibud. The year 39 commenced on 17th June 628, though Khusrau II had been deposed on the 25th February 628, and killed four days later on the 29th. Drouin explains this fact by the ignorance of the death of the king in the cities remote from the capital and thus supports my theory. (See also what is said by Noeldeke, Tabari, p. 432; Mordtmann, Z.D.M.G., 1880, p. 140; and Gutschmid, Z.D.M.G., 1880, p. 746).

11th October, 1916.

FURDOONJEE D. J. PARUCK.

186. ON A SILVER COIN OF THE SASSANIAN KING KHOREZĀD-KHUSRAU.

[Note.—In order that the French and German quotations be well comprehended I have thought fit to give their fairly literal translation into English, rather than giving them in the original language.]

According to Drouin, the essays of Mordtmann, combined with the plates of Bartholomaei, should be used still as the

basis of all Sassanian studies. Dorn in his preface to these plates (page 9) remarks: "In this magnificent collection one seeks in vain coins of the two Sassanian queens Boran-dukht and Azermi-dukht and other ephemeral kings, if they ever struck any coins. But the absence of these is compensated by many others which are not found elsewhere. In any case this collection is unique of its kind and the most complete that is known to me." Though new types have been published, no addition has been made to the list of sovereigns whose coins are known save in the case of Bistām and Queen Bōrān. The discovery of coins of any sovereign not mentioned in these plates can be regarded without question as a matter of great numismatic interest.

I bought recently two parcels of Sassanian coins, several of which are very rare. Out of these I found two similar in design to those of the last years of Khusrau Parvīz. On the obverse of one is the face of a king with moustache and beard and on the other that of a young boy without the slightest trace of any hair on the lips or chin. The reverse of both are practically the same in design, having the same mint (NIHCh) and same year (two). The former bears the legend on the obverse "*Aūharmazī*," the latter "*Khūsruī*." The crowns of both these kings are exact copies of that which adorns the head of Khusrau Parvīz in the issues of the last years of his reign (Dorn, Pl. XXX).

Thomas (Sassanians in Persia, p. 26) says: "That these headaddresses have considerable significance in the attribution of our medals, and in most cases, even where the legends are hopelessly obscure or obliterated, we can place our specimens with the utmost certainty by the test of the form of the crown, which was officially adopted and usually retained throughout as the banner or special discriminatory emblem of the ruling monarch."

On that assumption as well as the general design and the legends I assign the former coin to Hormazd V (Dorn, Pl. XXXI, fig. 2 *) and the latter to Khusrau. But the question is, which Khusrau? Of course the one who ruled after Khusrau Parvīz; because on comparing the portrait and tiara of his second year (Dorn, Pl. XXVIII, figs. 3 and 4) with those of my coin, a vast difference is at once noticeable, forcing us to the conclusion on common numismatic grounds that this coin is of a king who ruled after Khusrau Parvīz. As far as is known to us there were three Khusraus who attained the kingship for a space during the period of anarchy.

Mordtmann (Z.D.M.G., 1880, p. 145) mentions a coin on which he reads the name "*Kesra*." It is a reading which is altogether uncertain. Thomas had proposed for this the reading "*Iarashf*" in 1872. The Arab form "*Kesra*" which was formed much later is impossible on a Sassanian coin where the

word would be written in Pahlavi as "Khusrui" (Drouin, *Revue Numismatique*, III, 11, 1893, p. 168).

Drouin refers (on the above page cited) to a coin of Khorezād-Khusrau. He says: "We have of a certainty the coins of: Kobād Shiroie (on whose coins we have the name Kobād-Firoz), Ardešhir III, Borān, Khorezād-Khusrau and Yezdegird." He has not mentioned Hormazd V, whose coins also are known.

Noeldeke (*Tabari*, p. xxviii) describes a coin of Khorezād-Khusrau in the Berlin Museum. "After the printing of this book was almost completed Dr. Ermann sent me the cast of a Pahlavi coin from the Royal Coin Cabinet of Berlin which, to judge by its appearance, belongs to the latest period of the empire and shows the name of Chosrau (*Khūsruī*). The number of the year is two (*tarīn*) and the mint NIH. As Dr. Ermann conjectures, this can only be Chorezādh-Chosrau. During his brief reign therefore there occurred a new-year's day; the second year which he counts is conjecturally that beginning with the 16th June 632 and is consequently the first of Yazdegerd III. A particularly interesting fact is that he is represented on the coin as wholly beardless like Ardashir III and like Yazdegerd III in his earlier days. He was therefore like the latter a child invested with the semblance of power by certain of the nobles. This very well fits in with the tradition."

Drouin supports Noeldeke in ascribing the coin to Khorezād-Khusrau. "We believe very willingly with Noeldeke that the piece in the Cabinet of Berlin which he describes (p. xxviii of his *Tabari*), with the legend Khusrui is of Khosroes III Khorezād." *Revue Archéologique*, 1898, p. 200).

Justi (*Grundriss der Iranischen Philologie*, Vol. II, 1900, p. 545) speaks of a coin of Khorezād-Khusrau which is dated from the second year. It is the same that is mentioned by Noeldeke and Drouin.

My coin is similar to the one in the Berlin Museum, described by Noeldeke, as will be seen from the illustration and its description later on.

Drouin laments (*Revue Numism.* III, 11, 1893, p. 167) that "The history of the last Sassanians is confusing and difficult to establish. Between Khusrau Parviz who died in February 628 and the accession of Yezdegird III, the last monarch of this celebrated dynasty, at the end of 632, that is to say during a space of four years, nearly ten sovereigns or pretenders came to the throne. This confusion arose partly from the brevity of the reign of each of these monarchs and partly from Oriental historians who do not agree as to either the number of these princes or their names. There are almost as many different lists as there are historians. They provide us with so many discouragingly different readings in the royal series of the last Sassanians. We can only hope that possibly Numismatics will throw some light on this confusion."

My investigations into the history of the coinage of this period have led me to expect a much lower degree of exactitude than I was at one time prepared to demand. The materials, either legendary or monumental, hitherto available for elucidating this history, are but scanty and it is unreasonable to expect much help from numismatics, when the number and variety of the coins of the last ephemeral sovereigns of the Sassanian dynasty are so limited.

To understand the history of these sovereigns I cannot do better than quote so distinguished a specialist on Iranian subjects as Justi (*Grundriss der Iranischen Philologie*, Vol. II, 1900, p. 545), whose terse account contains all the historical information we require for our immediate purpose.

"During the time of his (*i.e.* Kobād Shīrōē's) minor son Ardashīr III there took place a greater incursion of the Khazars in Georgia, Albania and Armenia. Shahrvarāz was defeated both in Uti and in the vicinity of Lake Jelam (Brosset, *Histoire de la Georgie*, additions 493). Thereafter this general, having obtained the consent of Herakleios at a meeting in Arabissos, removed the youthful monarch and himself ascended the throne on the 27th April 630. He was slain on the 9th June. In Khorasān he was opposed by Khusrau III, the son of Kavādh, a brother or more correctly son of Ormazd IV, immediately after the death of Ardashīr. Then we find mentioned a Juvanshēr, son of Khusrau II, and Gurdia, a sister of Bahrām Chūbīn, who according to certain sources had already been assassinated by Siroē (see Noeldeke, *Gesch. d. Pers.* 390, note 2). After Shahrvarāz, Bōrān, who is alleged to have been married to him, was crowned in Ktesiphon. She was a daughter of Khusrau. She finally concluded peace with the emperor. The restoration of the holy cross is ascribed to her, but it was received earlier by Herakleios (according to Theophanes in 503 from Kavādh), because it was ceremoniously set up on the 14th September 629, and it was later brought to Byzantium (see Guidi's *Syrische Chronik* 32). Bōrān reigned from May 630 to October 631 (these dates are inferable from the coins, see Drouin, *Revue Numism.* III, 11, 1893, 162). It appears that she abdicated the throne in consequence of the defeat of her general. After the brief interregnum of Jushnasbandeh, a cousin or more correctly nephew, of Khusrau II and son of Kavādh (according to Tabari), the brother of Khusrau II, there came to the throne Āzarmidukht, a second daughter of Khusrau II, who, however, found a rival king in Ormazd V, the son of one of the sons of Khusrau II killed by Siroē; who according to his coins, which are still existing, upheld himself till his second year, that is up to the first year of Yezdegerd, and then was killed by the soldiers in Nisībīn. After the assassination of Āzarmidukht there followed a Khusrau IV, son of Mihr Jushnasp and a grandson of Khusrau I. Then came Pērōz called Jushnasban-

deh, probably his brother, and after him a son of Khusrau II, who had escaped murder, named Khurrazād Khusrau, of whom we possess a coin which is dated from the second year; so that he must have reigned shortly before and after the New Year's day, 16th June 632 (Noeldeke, *Gesch. d. Perser* XXVIII). Thus between the death of Khusrau II on the 29th of February, 628, and the advent of Yezdegerd III, from whom the era of Yezdegerd is dated 16th June 632, there reigned twelve persons and during this chaos the lance thrusts of the Arabs threatened the gates of the Empire."

It seems clear that *Khorezād-Khusrau* and *Ferrukhzād-Khusrau* are the names of one and the same person. There is a great deal of confusion between the words "*ferrukh*" and "*khore*," both having the meaning of "Majesty" and employed for designating the king. For this confusion see Noeldeke, *Tabari*, pp. 292 and 395; Guidi, *Syrische Chronik*, 1893. p. 24; Justi, *Namenbuch*, p. 97; and Hübschmann, *Iranica* in *Z.D.M.G.*, 1893, p. 622.

Khorezād-Khusrau was a son of Khusrau Parviz. He reigned for a short time before and after the 16th June 632, and was slain in the second half of 632 or the first half of 633.

I think I am not far wrong in concluding from the history of this period that more than one sovereign ruled simultaneously in different capitals, set up by the contending factions. This state of things has perhaps led to the confusing nature of the dates. In order that some idea may be formed I place before those who would interest themselves in the pursuit, a certain amount of materials collected for my own use, which have a special bearing on this period, but which circumstances make it impossible for me to utilize immediately to the full.

Description of the Coin.

Metal—Silver.

Weight—64·5 grains.

Size—Oval, $1\frac{1}{32}'' \times 1\frac{3}{16}''$.

Date—Two.

Mint—Nihch.

Obverse.—The bust of king to right, wearing a crown adorned with two wings and surmounted by a crescent and star. The hair of the head is brought behind and arranged in a cluster of locks. The face is that of a boy without the slightest trace of moustache or beard, having in the ear a triple pendant of pearls. Round the neck, a pearl necklace having two pendant pearls in front and two strings of pearls reaching below the bust. The dress is adorned with a crescent and star on each shoulder. In the field over both shoulders float a Sāsānian fillet and a crescent over the left shoulder near the chin. Between the crown and the wing behind the head is a

Names of Sovereigns.	Mirkhond.	Hamza.	Noeldeke, Tabari.	Mordtmann.	Drouin.
<u>Khusrau</u> Parvīz ..	38 years	38 years ..	Dethroned, 25th February 628. Died, 29th February 628.	End of reign, 25th February 628.	Death, February 628.
Kobād Shiroē ..	8 months	8 months ..	Accession, 25th February 628.	Accession, 25th February 628.	Accession, February 628.
Ardešīr III ..	50 days	1 year 6 months ..	September 628 ..	November 628 ..	September 628.
Shahr barāz ..	1 year or 40 days	....	27th April 630 to 9th June 630.	629	April to May 630.
Juvanshēr ..	1 year	....	....	630	....
Bōrān ..	16 months	1 year 4 months ..	Summer 630 to Autumn 631.	630	May 630 to October 631.
Firōz Jushnaspbandeh ..	6 days	Some days ..	1 month ..	January 631 ..	....
Āzermīdukht ..	6 months	" ..	6 months ..	March 631 ..	....
<u>Khusrau</u> ..	Very few days	....	Some days ..	May 631 ..	....
<u>Khorezād-Khusrau</u> ..	....	1 year ..	" ..	....	....
Firōz ..	....	....	" ..	....	....
Ferrukh-zād-Khusrau ..	Not above a month	....	....	July 631 ..	....
Hormazd V ..	....	....	....	September 631 ..	....
Yezdegerd III ..	20 years	....	End of 632 or beginning of 633 to 651 or 652.	16th June 632 to between 21st March and 23rd August 651.	Accession, December 632. Killed, September 651.

good luck and prosperity in ancient Ērān. This celestial phenomenon is represented for the first time on the drachmes of Phraates IV, son of Orodes, the Arsacid king who reigned from 37 B.C. to 4 A.C. Is it as a sort of irony that Phraates IV, the parricide and fratricide, had chosen this symbol? The Pahlavi word which designated this astrological conjunction was *nazdake* (Avesta, *nazda*); the Arabic word *‘iqtirān* becomes *qirān* in Modern Persian. The sign of the conjunction reappears on the coins of Firōz in the third year of his reign (460 A.C.). This symbol is set on the coins of this sovereign and of his successors above the altar on the reverse till the end of the dynasty. Besides it is figured, on the obverse to the right and to the left of the royal crown, from Kobād (488 A.C.). Lastly, dating from the thirteenth year of the reign of the same monarch, the symbol of the reunion of Venus in the crescent is figured at three places on the margin of the obverse of the piece, and it hereafter forms part of the Sāssānian type until after the conquest and under the Arab governors of Persia. We know that these governors had adopted for their coins the type of the Sāssānian piece with the legends in Pahlavi, and the figure of the altar of fire, albeit contrary to the religion of Muhammad. The altar and the symbol disappear from the purely Arab coins bearing Kufic characters; but the astrological figure becomes the emblem of the Muslims and formed the origin of the crescent on the banner of Muhammad.

The Persian astrology had been borrowed with its wise organisation from the Babylonians. The Avesta and the Pahlavi literature make frequent mention of astrological devices side by side with the cosmological and meteorological phenomena. In the history of the Sāssānians it is often connected with the horoscopes and the consultation of stars by the sovereigns. We find in consequence, on engraved gems, numerous astrological subjects, notably the signs of the zodiac and the image of Anāhita, the only goddess that is represented. The name of Venus, in the Avesta, is Anāhita "the immaculate." It was peculiarly adored in Persia and the Avesta contains a very poetic hymn about this goddess: "The high and powerful immaculate which has descended from the stars upon the Earth." It belongs to the epoch in which the cult of this strange divinity was introduced by Artaxerxes Mnemon (404-361 B.C.). It is thus we can explain the presence of the figure of Anāhita on the Sāssānian engraved gems. In the first century of the Christian era, Anāhita is confounded with Artemis. In the Chaldean astrology the name of this planet is Ishtar (the goddess of the sky, *bēlit*-shame), famous in the Assyro-Babylonian mythology, and this becomes the Astarté of the posterior Semitic religions. In the cuneiform texts the name of Anāhita is Damiqitou (from *damaqou*, to be pure), she is the goddess of the waters, wife of Iao, god of the ocean, the pure element

par excellence. The Greeks have transformed Damigitou in $\Delta\alpha\upsilon\kappa\eta$ and the Persians have translated the name in their language; but they have changed the attribution and have applied to the planet Venus, on account of its brilliant light, the name of the Chaldean goddess of purity. During the Pahlavi period the name of Venus was Anāhita but the modern Persian name is *nāhid* and the Arabic is *zahera*, which has the same meaning of "brightness." (Drouin, Gazette belge de Numismatique Bruxelles, 1901).

The moon in the Cuneiform inscriptions is *ilu Sin* "the god Sin," in the Avesta it is the god Māonha, which in Persian became Māh. Whether at a remote epoch the Avesta people gave, like the Babylonians, to the moon the precedence over the sun (see Jastrow, *Die Religion Babylonien und Assyrien*, 1905, p. 72) cannot be proved from the Avesta. The sun as the orb of the day, giving light and warmth, the moon as the light of the night, regulating the time by its waxing or waning, have from the most ancient times been the object of worship. Both are often invoked in the Avesta. The *Khōrshēd yasht* and *Khōrshēd Nyāyish* are dedicated to the sun, and the *Māh Yasht* and the *Māh Nyāyish* to the moon. In the writings of the younger Avesta the religion of Zoroaster no longer appears in its original state, but has in the course of time lost a part of its old traditions and taken up various new elements (see Geldner, *Ueber die Metrik des jüngeren Avesta*, p. IV). It is certain that in the latest times of the Sāsānians, who called themselves brothers of the moon and wore a crescent on their diadem, as we see from their coins, the cult of the moon became more and more important. It is indeed possible that the cult of the moon-god was transmitted from Babylonia. A testimony to the higher rank of Sin, the moon-god, in Babylon is the computation of time according to the moon-phases, the moon being on account of the regularity of its changes a better guide for men than the sun. (See Jastrow, I, pp. 66, 67, 72 and 73).

Recently Huesing has expressed the opinion (*Iranischer Mondkult*, *Archiv-für Religionswissenschaft* IV, 349-357) that the moon played a part of considerable importance in the Iranian religion. The orb which, in the stereotyped representations in relief of the Achaemenian tombs at Naqsh-e Rostam, floats in the air above the fire-altar, is, according to him, intended for the moon. In Stolze's well-known work the author believes that he recognises on the first tomb of Persepolis the crescent at the base of the orb. In Dieulafoy's book (*L'Art Antique de la Perse, Achéménides, Parthes, Sassanides*, Paris, 1884-86) the half-circle, as the author says, may be seen quite distinctly, for example, in Plate IV, *Tombeau de Darius*. Dieulafoy speaks of it plainly as the "disque lunaire" (III. partie, p. 4). Hitherto most scholars took this orb or rather globe for an emblem of the sun. Ker-Porter, who visited the

tombs, says in his description (Travels in Georgia, Persia, Armenia, Ancient Babylonia, etc., Vol. I, pp. 516-524) of this first tomb-relief as follows: "A pedestal of three steps is surmounted by an altar evidently charged with the sacred fire, a large flame of it appearing at the top; high over it, to the right, we see a *globular shape*, doubtless intended for the sun, of which the fire below was the offspring and the emblem." Spiegel (Erân. Altertumsk. III, 810) says: "A globe which no doubt is intended for an emblem of the sun or of Mithra." Also Weissbach (Grundr. d. ir. Phil. II, 57) takes the disc for the sun, and K. D. Kiash, who, like Weissbach, visited these tombs on the spot, expresses himself as follows: (Ancient Persian Sculptures: or the Monuments, Buildings, Bas-Reliefs, Rock Inscriptions, etc., belonging to the kings of the Achæmænian and Sassanian Dynasties of Persia, by K. D. Kiash, Bombay, 1889, p. 140.) "Opposite him (i.e. the king), on a platform, is a burning censer, on the top of which is an emblem of the rising sun." On the excellent reproduction which Kiash gives on Plate xlvii, a shade is drawn into the circle above the fire-altar, which has, I believe, no other purpose than to point out that the emblem is a *globe* and not a mere circle. A photographic reproduction of this relief, representing a globe, will show on the right or the left side and beneath, according to the distribution of light, a shade which may be mistaken for a crescent. No doubt a celestial orb is represented here, but the crescent which Huesing professes to see in Stolze's work is, I think, nothing else but the shade of the globe, which the photographic reproduction gives unmistakably. Perhaps the difference between the representations of Stolze and Dieulafoy may be explained by the different distribution of light on the occasion of photographing. A. V. W. Jackson (Persia Past and Present, pp. 297-8), who visited the tombs, takes the orb for the sun. "The monarch is portrayed in the same manner as he is seen on the Behistan sculptures, bow in hand, but his attitude is now that of worship before the sacred fire, over which floats the familiar winged effigy of Auramazda with the emblem of the sun shining in the background." We must bear in mind the prominent place which the moon worship undoubtedly held in very ancient times in Babylonia, Armenia and in Persia under the Sâssânians. If Huesing is right, the moon-cult of the Iranians should have existed already at the time of Darius I. Also Christensen (Orientalistische Literaturzeitung VII, pp. 49-52) thinks it not improbable that, at any rate in the time of Zoroastrianism, the cult of the moon-god was closely connected with fire-worship.

The veneration of fire, especially of the fire of the hearth, is one of the most ancient religious conceptions. It is not astonishing, therefore, to find it also in the Avesta, which preaches everywhere veneration for the element of fire. Hence we find

on the coins the fire-altar, which is not of the king as suggested by Mordtmann, but as Drouin rightly affirms consecrated by the king, and I think Thomas is right in representing it (Sassanians in Persia, p. 18) as "the small portable altar depicted on the coins, which, as a portion of the religious paraphernalia, formed so constant an accompaniment of regal processions and royal progresses, from the days of Cyrus the Great to those of Yesdegird, who carried his revered fire in its fit receptacle even in his last hasty flight before the conquering Arabs."

On account of the veneration of fire the Persians have often been called "fire-worshippers." It would be equally logical for Christians to be called "Cross-worshippers" after the symbol of their faith. Even in early times Muhammadan writers have endeavoured to defend the Persians from this charge. The immortal Firdausi says in his *Shāh-nāmeh* :

مگوی که آتش پرستان بودند پرستندگان پاک یزدان بودند

"Say not that they (i.e. the Persians) were worshippers of fire, they were worshippers of the Holy God."

It will suffice to say that the Persians and their descendants the Parsis do not worship fire as a divinity. Fire was considered by Zoroaster as the purest symbol of the Divinity, and is held by the Zoroastrians to be the emblem of refulgence, glory and light, the truest symbol of God, the invisible Creator of the universe. Therefore the observances paid to fire are very prominent.

I must deal at some length on the monogram on the obverse and the mint-name on the reverse of this coin, in continuation of my previous note on the coin of Queen Bōrān.

There appeared a monogram which replaced *afzū* on the coins of Hormazd IV in the sixth year of his reign. (Dorn, Pl. xxvi, fig. 11). This monogram is composed of several letters and strictly speaking it is but a conventional representation of the word *afzū*, which it has replaced. The interpretation of this sign has caused a good deal of discussion, and has been interpreted in diverse ways by Dorn (*Bulletin Histor.*, 1843 and *Mélanges asiatiques*, t. III, 1857); Stickel (*Handbuch der morgenländischen Münzkunde*, 1870, p. 98 and following); Mordtmann (*Z.D.M.G.*, VIII, XII, XXXIV, p. 129); Thomas (*Indo-Sassanian Coins*, 1883, p. 17); and Drouin (*Revue Archéologique*, 1884, 1885 and 1898).

We find later on, under Khusrau II, the word *afzūn*, *afzūt* or *afzūtū* accompanied by a monogram, which is similar to that on the coins of Hormazd IV, and was adopted as a rule by his successors to the throne of Persia and preserved by all the governors and princes who struck coin after the Sāsānian type. Drouin asks us to distinguish them separately but Mordtmann thinks that the second is only the degeneration of the first.

Thomas reads *salam* for the first sign and *amach* for the second; but he adds that the right sense remains an enigma. Mordtmann reads *zamān afzūt* "tempus augeatur"; Stickel, *sim* "argentum auctum"; Dorn, *gadman*; and Drouin has decided on *gadah* "majesty" and translates this monogram generally with *afzūn* by "long live his majesty." He at the same time adds "But nothing justifies these diverse readings, as we do not find in this symbolic sign any element of the word '*gadah*.'" It is certain, nevertheless, that this unknown sign represents a word which must go with *afzūn*, and if it is not the Semitic word *gadah*, it ought to be something equivalent, which must rather preserve for us the significance of this monogram." The Persian dictionary *Borhān-i-Kāfi* gives in express terms: "Gadman is an old word which in Zend (Pahlavi) and in Pāzend (Fārsi) is pronounced gadmin and signifies the spiritual light and splendour."

Clearly the savants are far from being in accord as to the reading of this monogram on the coins of *Khusrau II* and his successors. It cannot be a sign without any meaning; but turn it in any direction whatsoever and no word can be made of it without stretching a point here and there so as to yield the diverse renderings quoted.

How did the monogram originate? It first appeared as we have seen by replacing the word *afzū*, and in such a form that the original word is legible enough. The gradual evolution could be well seen in Dorn (Pl. xxvi, figs. 11, 12 and 14 and Pl. xxvii, fig. 20). The word *afzū* could at first be traced, but when we come to *Khusrau II*, no vestige of the word remains, and that is in my opinion the main reason which induced Drouin to distinguish both monograms. The view of Mordtmann, who takes the latter to be the degeneration of the former, is reasonable. One very remarkable fact is that while we do not find any monogram on the coins of *Bahrām Chōbīn*, the monogram of *Khusrau II* appears on the coins of *Bistām*, both rebels aspiring to the throne. If Dorn (pl. xxviii and following) be studied, it will be seen that the meaning of the symbol is lost and the defunct monogram is placed above the word *afzūt*. If there is at all any meaning to be attached to the monogram of *Khusrau II*, I would suggest that it is the degenerate form of the monogram of *Hormazd IV* which replaced the word *afzū*. The original significance of the monogram must have been forgotten, for otherwise the employment of two words one above the other, both having the same sense, would be a pleonasm difficult to admit.

Although we do not find any monogram on the coins of *Bahrām Chōbīn*, the device occurs on some but by no means all the coins struck in the first year of *Khusrau II*. *Tabari* (*Zotenberg*, t. II, p. 269) relates that *Bahrām Chōbīn* had struck at Rai a hundred thousand dirhems in the name of

Khusrau, son of Hormazd, though he was at the time only a Prince Royal, and that these dirhems have the face of Khusrau on both sides. Drouin admits (*Revue Archéologique*, 1898) that "It is not impossible, nevertheless, that the fact of the issue is accurate, that among the coins we have of Khusrau II with the date of year one "aioki," the figure and the youthful appearance indicate that they appertain to this issue." In my opinion those without the monogram and without the winged-crown are actually the coins mentioned by Tabari, but with the face of Khusrau on one side only.

The mint is expressed on this coin in four letters NIHCh. Ed. Thomas (*Journal R.A.S.*, 1852, p. 402, Pl. I, No. 39) confounded this monogram with NIH; ignoring the bent form of the extremity of H which presents itself very clearly on the coins. This curve in the form of C can only be the letter Ch.

Mordtmann (*Z.D.M.G.*, 1879, p. 120, No. 25) followed Thomas in taking both the monograms together and read NIH. He identified them with Nishapur and added that in Pahlavi Nishapur was also written Nhshapur. But some hesitancy is revealed by his remark that it is not clear whether both these monograms mark the same locality as both of them are found in the same years, viz., Khusrau I, year 14, 28, 32; Hormazd IV, year 10, 11; Khusrau II, every year.

Subsequently (*Z.D.M.G.*, 1879, p. 125, No. 45) he read this same monogram on a coin of Khusrau II, year 9 as NACH and expressed his belief in the identity of the monogram with the name of نَخَجَوَان or نَخَجَوَان. Nakhjevan on the Araxes on the Russo-Persian frontier, the *Naξovava* of Ptolemy (V. 13).

These readings are no longer tenable in view of the conclusive arguments of De Morgan (*Revue Numismatique*, p. 360, § 118). "This reading (NACH) seems very doubtful, if we take into consideration the numerous specimens which have passed through our hands. The presence of Č (Ch) is certain, while as for the intermediate letter, it is composed of two strokes rounded off and not squared as in A. Frequently the first is completely separated from the second, which forms the head of H. We think therefore that it must read NIHČ and not NAC. If this reading of Mordtmann were acceptable, his interpretation would involve the attribution of the value Kh for the Pahlavi A, which does not take place in this instance.

The reading NAHČ admittedly suppresses the A in Nakhcheran; but it should be noted that the Arabs occasionally wrote the name of this town as نشوي and in no case did they introduce the intervening alif. We therefore get the result NIHCavan."

Unfortunately he does not give the situation of this town. Owing presumably to an error on the part of the printer the

name is given Nihcavan, but it should be NIHCavan (Nihch-avan), because he reads the monogram NIHC̣ (Nihch). The correction can be made without hesitation as typographical mistakes are far from uncommon in the paper.

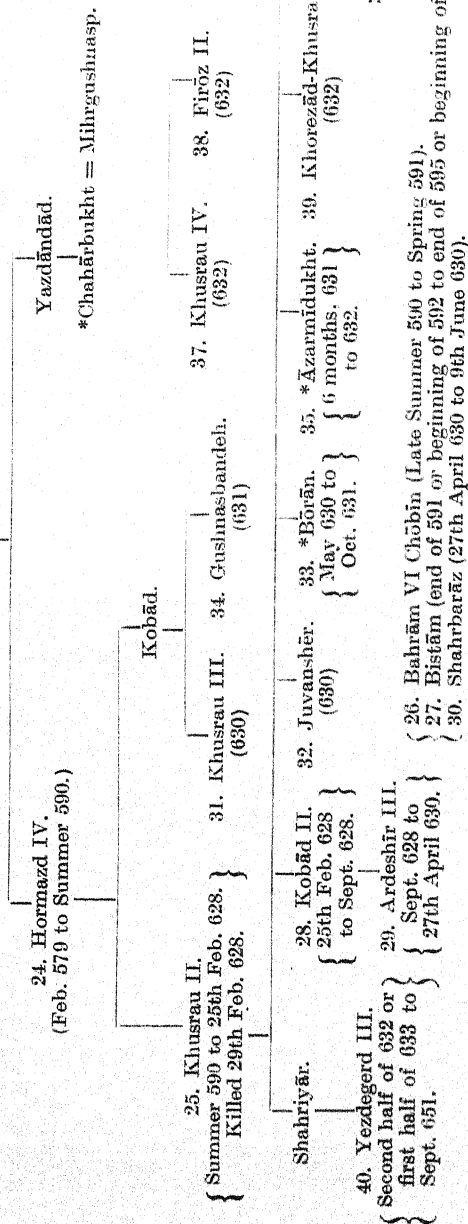
The monogram NIHC̣ occurs on coins of Khusrau I of the years 14, 28, 32, 34 and continues regularly till the end of the reign of this king. Then it appears during the reign of Hormazd IV, years 10 and 11, and from 590 A.C. in the reign of Khusrau II it shows itself almost every year till his death in 628 A.C., and again from 629 to 632. It reappears under Yezdegerd III in 634 and 638.

THE GENEALOGICAL TREE OF THE LAST SOVEREIGNS OF THE SASSANIAN DYNASTY.

(Those marked * are princesses.)

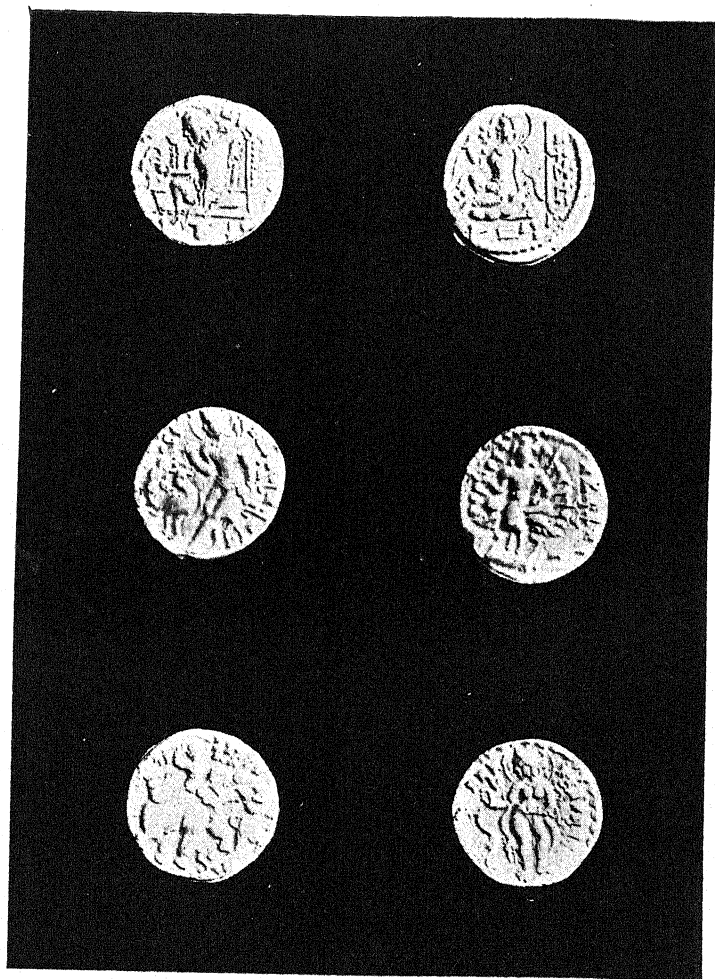
{ The dates indicate the reign of the sovereigns.
{ The numbers indicate their order. }

23. Khusrau I.
(13th Sept. 531 to Feb. 579.)

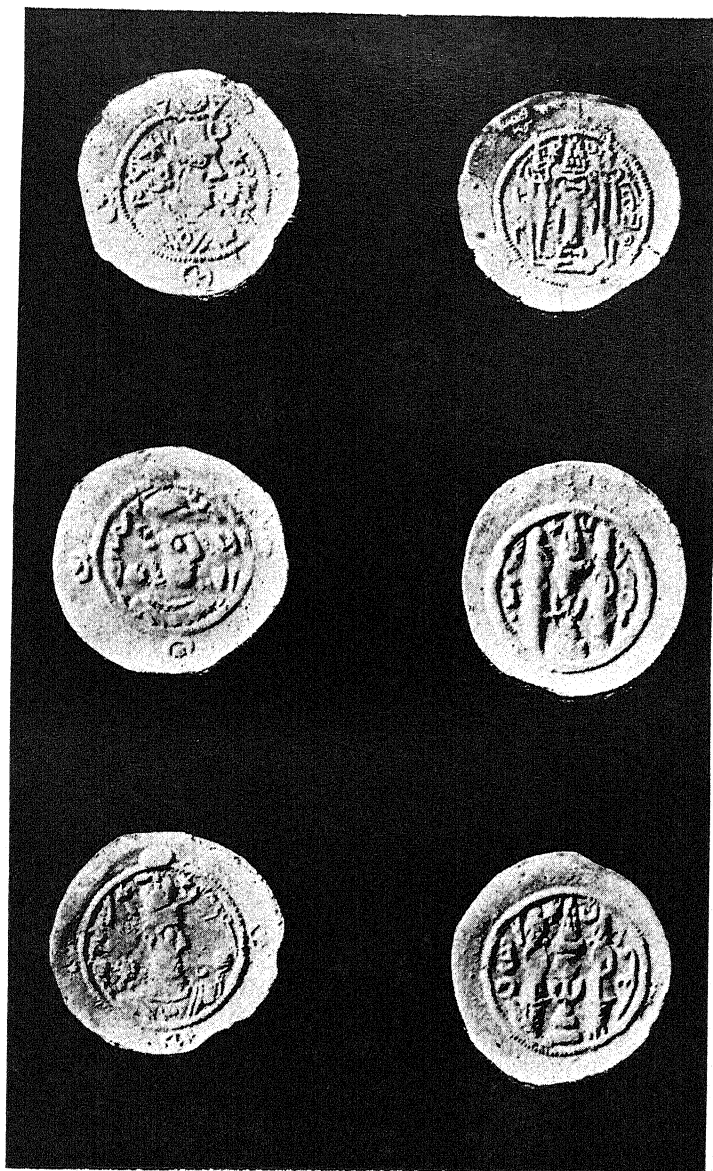


These three did not belong to the house of Sāsān.

FURDOONJEE D. J. PARUCK.



SHASTRI, "THREE GUPTA GOLD COINS."



PARUCK, "THREE SASSANIAN DRACHMES."

12. The Antiquities of Burdwan.

By MAULAVI 'ABDU'L WALL.

I. PĪR BAHRĀM.

I visited the shrine of Pīr Bahrām at Burdwan more than once in 1915 and 1916. The quarter where the Saint is buried is also called after him 'Pīr Bahrām,' and as such, is noted in Persian and Vernacular instruments. The Āstāna is a historical sight of the town; and the Musalmāns of the neighbourhood, who speak Urdū as their mother-speech, have been living there since before the time of the British Government.

Blochmann visited Burdwan and published a brief account of Pīr Bahrām in the Proceedings and Journal of the Society.¹ He noticed two basalts; one in the inner door of the shrine, and the other on the right of the portico, with inscriptions. The latter, he found so defaced that it was impossible to read it. Both the slabs have now been fixed into an outer wall of the Āstāna. Blochmann published only the upper part of the first-named inscription, and left out the lower part of it entirely. It is strange that the inscription which Blochmann found defaced is quite legible. He published the first verse of the first inscription, which is comparatively illegible, and left out the second verse, and the marginal writings, without any comment. I am afraid, he trusted too much the Āstāna people for a copy of the inscription.

The Saint.

The Saint is variously called Pīr, Darvīsh and Hājī, but at Burdwan only by the first title as a prefix.² Baharām 'Saqqā' was a Chaghtāi Turk of Bokhāra, and came to India during the reign of Humāyūn. He made pilgrimages to holy places, and was in the habit of distributing water from his water-skin and bowl to the wayfarers and the poor. For this self-imposed task he was called *Saqqā* or drink-offerer.³

Dressed as a Faqīr, with a water-skin (*Mashak*) and a leathern wallet (*zambīl*) with drinking cup (*kūza*), there arrived one day in 970 H., so the Khādim of the Āstāna told me, Pīr Bahrām at Burdwan—where most probably then lived a Muhammadan Official of the Great Mughal—and begged a Jōgī, Jaipāl by

¹ J.A.S.B. for 1871, part I, pp. 251-252, and the Proceedings of the same year.

² *Vide* Inscription no. II (below), dated 1015 H. (1606-7 A.D.).

³ *Saqqā* means one who offers drinking-water to others.

name, to give him the land where he lived. Miracles were demanded and worked. The Jōgī being convinced of Pīr Bahrām's sanctity, at once complied with what turned out to be the last request of the Saint. The Jōgī who became his disciple, wanted to go away, but the Saint bade him stay on. After three days Pīr Bahrām 'Saqqā' died, and was buried on this land—his own land.

The late Munshī Muḥammadī of Burdwan noted in a *bayāz* certain biographical notes about Hājī Bahrām Saqqā's life from Nudrat and *Khushgo*¹ in Persian. His son, Maulavī Ikramū'l-Haq, whom I met, recopied them in a separate paper, which I discovered among the documents in the custody of the Mutawalli. The notes were rendered by him, as he told me, into Urdū, from which the interesting particulars published in the "Gazetteer of the Burdwan District" (1910 A.D.) are compiled. So far as I am aware, the author of the *Sohof-i-Ibrāhīm*, and Nudrat, alluded in their accounts of the Saint, as to his death at Burdwan.

According to these, Hājī Bahrām 'Saqqā,' who had made pilgrimages to Makka, Madīna and Najaf, enjoyed the good graces of Emperor Ākbar, who placed implicit confidence in him. He was accused of being a Rāfiṣī. He therefore left Āgra in disgust, and died, as I have mentioned, at Burdwan. On the news of Saqqā's death reaching Ākbar, he allotted the revenue of Bahrām Bazar, now Puratan Chāuk (a part of the town, where the Mahārājā's College is situated), and Mirzapūr, for the maintenance of the Shrine. I could get no information about Faqirpura, situated close to Burdwan, which was, too, given as a Madad-i-M'aāsh, according to one of the inscribed basalts. The Government settled the Mauza's with the Mahārājā of Burdwan as a part of his Zamīndārī, and in lieu thereof, they pay Rs. 41-2-4 a month to the Mutwallis of the place; the maintenance charge is met from the fixed grant.

I was shown the place where the Jōgī, Jaipāl, was buried.² It is in a corner of the garden on the roadside. The devotees, I was told, formerly used to place their *chelam*, or earthen pipe, with gāṇja into a masonry hole of the tomb on the roadside, and the gāṇja used to be lighted miraculously.

The Dargāh is an object of archaeological interest. The "tomb" is placed inside a Mausoleum, covered by one dome. The battlement of the walls is curved. The entrance is from the south, with a portico in front. The original brick-carvings have now been hidden in plaster and whitewash. The sur-

¹ Nudrat's book is scarce. *Khushgo* was the pen-name of Brindaban, a Bania of Benares. His Tazkira entitled the *Safina-i-Khushgo* سفینه خوشگو was completed in 1147 H. (1734 A.D.).

² Vide List of Ancient Monuments in Bengal, Revised and Corrected up to 31st August, 1895: Calcutta, Bengal Secretariat Press, 1896.

roundings of the Dargāh are very pretty, covered with fine shady trees with a large tank to the north.¹

There have been buried in the garden prominent men of Burdwan, including the good Jōgī, Jaipāl. Close to the shrine there are one or two masonry cottages where the faqirs used to go into *Chilla* or retreat for forty days, and in one of which, across the road, the water-skin, bowl and the leathern wallet of the Saint used to be kept and shown to the devotees. The leathern *zambil* or wallet to carry the bowl of water, etc., is the only article of the holy water-distributor still left to us, and is kept inside the tomb. All other things, but this one, have long disappeared, being worm-eaten and deteriorated.

The Inscriptions.

There are two inscribed stone slabs as mentioned above. The native carvers, to whom I think the work was entrusted, were no experts, and the letters are so defective and badly inscribed that I, too, like Blochmann would have been unable to decipher them but for some fortunate circumstances. The *Qat'ā*, or the upper part of the first inscription, published with translation in the Journal for 1871, contains, at least, two errors which I was enabled to rectify from a copy of it made by one of the former Mutwallis on a fly-leaf of Saqqā's Poetical Works (*Diwān*) preserved at the Āstāna. The verse has the following headings:—

تاریخ وصال حضرت حاجی الحرمین الشریفین بهرام سقا قدس اللہ سرہ
کہ در سنہ نہصد و ہفتاد ہجری واصل حق شدند - * قطعاً از فتحي *

"Date of the union (death) of the pilgrim of both the holy Harams, Bahrām "Saqqā," may God sanctify his secret, who was united with God (died) in the year 970 H. A *Qat'ā* by *Fat'hā*."

Inscription I.

(A)

یا اللہ یا فناح یا اللہ یا فتاح یا اللہ
لا الہ الا اللہ محمد رسول اللہ - حقاً
زہے درویش عالم گشتہ بہرام
کہ در عرفان دل او ہون دریا

¹ Annual Report of the Archaeological Survey, Bengal Circle, for 1903-4.

ز عالم رفت در راه سرانديپ
 شد از ملک فنا بهرام دانا
 حساب سال فوت آن يـگانـه
 ز حق کردیم چون فتنه ي تمنا
 ندا آمد که تاريـخ وفاتش
 بود درويش ما بهرام سقا

(B)

بهرام که بود شهره در سقائي
 بی حيله و زرق
 بود عالم علم ديني و دنيائي
 نا خوانده سبق
 در نهصد و هفتاد برفت از عالم
 در کشور (؟ هند)
 زد خيمه آنس بر در يکتائي
 شد واصل حق

There are some writings on both the margins of the above inscription, which no doubt contained the name of the person by whose order the inscription was engraved. Some words on the left margin read as *بناء المسجد دو سنه من درويش*

If this inscription be divided into three parts, it will be seen that the first or upper part (marked by me A) was carved better than the second or lower part (marked B), where the carver, in addition to his unfitness, found no sufficient space to proceed on. The second is a Rubā'i with Mustazād, but I could read this beautiful piece as I found it written elsewhere.¹ The third part, viz. the writing on the two margins, is worst of all. The two words of the inscription overlined by me do not appear to be correct. In 1. 2 of the *Qat'ā*, the word *دلي* for *دل* and in 1. 6 the word *فتحي* for *فتح* is apparently wrong. Blochmann copied and translated the words, as he found them.

¹ Catalogue of Bankipur Library.

I have corrected them from the copy in the fly-leaf of Saqqā's *Dīwān*, referred to above.¹

Translation.

(A)

O Āllāh, O Fattāh (Opener), O Āllāh, O Fattāh, O Āllāh.
 There is no God but Allāh, Muḥammad is the Vicegerent
 of Āllāh: In truth.
 Verily Bahrām was the Saint of the world (*i.e.* the Saint
 of world-wide renown)
 Whose heart, in the true knowledge, was like the Ocean.
 He went away from the world, on his way to Ceylon.
 Bahrām, the wise, quitted this transitory realm.
 When the calculation of the year of that unique one's
 death
 I desired from God, O Fat-hī,
 A voice said that the date of his death
 Is our *Darvish Bahrām Saqqā*² (970 H. = 1562-63 A.D.).

(B)

Bahrām who was renowned in distributing water
Without excuse and deceit
 Was learned in the Sciences, religious and temporal,
Without taking a lesson.
 In Nine hundred and Seventy, went away from the world
In the country of (? India)
 (And) pitched the tent of attachment on the gate of Unity,
Became mixed with the Truth.

Inscription II.

بسم الله الرحمن الرحيم
 بمضمون آية كريمة وأتمى المال على حبة ذوى القرنى واليتامى والمساكين
 وابن السبيل والسائلين وفى الرقاب - بتصدق فرق مبارك بندگان حضرت
 شاهنشاهی قویة فقیر پوره جہہ مدد معاش فقرا و مساکین مؤثر پر انوار پیر

¹ I found another poem probably by the poet *Fat-hī* copied by the same hand on the fly-leaf of the *Dīwān*. It is perhaps worse than the one engraved.

² The date of Bahrām Saqqā's death as given by Blochmann is not correct, as he has added 12, the numerical value of بود, to 970 (970 + 12 = 982).

بهرام بموجب نوشتۀ علیحدہ مقرر نموده شد و مقولہ شیخ بختیار باشد تغییر
کندند این قویہ بلعدت خدا و نفرین رسول گرفتار باشند *

فی سنہ ۱۰۱۵

Translation.

In the name of God, the Merciful, the Compassionate.

In accordance with the holy verse "and who giveth wealth for His Love to kindred, and orphans and the poor, and the son of the road (wayfarers), and beggars, and those in captivity"; and in atonement for the auspicious head of the slaves of His Imperial Majesty,¹ the *Qarya* (village) *Faqirpura*, in accordance with the separate writing is set apart on account of the *Madad-i-M'aāsh* of the poor and the needy of the illuminated tomb of *Pir Bahrām*. And *Shaykh Bakhtyār* is appointed to be the *Mutawallī*. Persons making any alterations in the *Qarya* will be afflicted with God's curse and the Messenger's abuse. Dated in the year 1015 H (1606-7 A.D.).

Hājī Bahrām, whose *pen-name* was "Saqqā," or drink-offerer, has left a *Dīwān* or collection of poems which are valuable assets of his esoteric doctrine, and give many particulars of the places and persons whom he visited. I saw a copy of *Saqqā's Dīwān* at his *Āstāna*, but it was incomplete. There are two copies of it at the Asiatic Society's Library. His poems bristle with the encomia of 'Alī and his descendants. I found at the end of the *Dīwān* a *Tarjībānd* refuting the baseless accusation that he was a *Shī'a*. *Saqqā* was not, however, a great poet. I quote a few lines of the above *Tarjībānd* and one or two other verses from his *Dīwān* :—

ای بیخبر از حقیقت کار	دیگر بخدا مکن توانکار
دریاب که غیر حق بتحقیق	در ملک وجود نیست دیار
در خلوت دل ایس ما کیت	از روی یقین بغیر دلدار
ما را هوس و هوای باطل	افگنده جدا ز وصل آن یار
خواهی که شوی بیار واصل	بگذار خودی ز بیدش بردار
تا سوی رسول و آل و اصحاب	یابی یقین زنی چو ابرار
باید که چو رافضی نداشی	ملعون حق و حق از تو بیزار

از جهل مکن بر فرض اسناد

صد لعنت حق برافضی باد

¹ Emperor *Jahāngīr* is meant.

(از همان ترجیع بند)

صدیق که ثانوی نبی بود از صدق دلیل شد درین راه

آن عادل خسروان کامل در کشورِ دلِ امامِ عادل
یعنی عمر آن امیرِ برحق کو بود بفقر و فاقه مایل

وله

تا ناله ز سوزِ بیند وائیسست مرا
در راه وفا
دل نغمه سرای کبریا ئیسست مرا
سقا بخدا
چون خسرو کشور قناعت گشتم
در خطه هند
القصه چه حاجت بگدا ئیسست مرا
در فقر و فنا

وله غزل

ز هر روی آنمه جبین مینماید ز من بوده دل را چنین مینماید
بزلف و رخ آن بت ره دین و دل زد ره کفر با من بدین مینماید
به بین نوگش را که در عینِ مستی بمردم چه گوشه نشین مینماید
چو دل بیگمان شد بهر جمالش درو آفتابِ یقین مینماید
کشیده کمان توی مستش ز هر سو بقصدِ دلِ من کمین مینماید
بچشمش ازان نقدِ دل می سپارم که در ملکِ خوبی امین مینماید
گدای در میکرده نزد سقا به از شاهِ روی زمین مینماید

وله غزل

ای آسیا ای آسیا بر گوی از بهر خدا
سرگشته میگردی چنین در دهر میجوئی کرا

بر روی آب افتاده بر پیچ و تاب افتاده
 در اضطراب افتاده بی صبر و آرامی چرا
 رمزی بگوز اسوار خود با ما زگار و بار خود
 با سینه افگار خود سر میزنی بر سنگها
 افتاده دور از مکان وز دست ما داری فغان
 چرخست از تو سرگران تو از چه می نالی ز ما
 سنگی توام از نیستی بهر چه بیغم نیستی
 بی ناله یکدم نیستی با ما بگو این ماجرا
 سنجش که بر سر میزنی مغزش پیرشان میکند
 بهر چه باشد دشمنی با دانه گندم ترا
 سقا درین دور قمر از آسیا بانی گذر
 تا کی کشی این درد سر بگذرز خوی آسیا

II. THE TOMBS OF QUTBU'D-DIN AND SHIR ĀFGAN.¹

The recently-repaired tombs of Qutbu'd-Din *Khān* and Shir Āfgan at the courtyard of the Āstāna of Pīr Bahrām were pointed out to me. Attached to these tombs there is a petty Mosque,² where the people of the Āstāna say their daily prayers. The tragic death of Shir Āfgan and Qutbū'd-Din have been narrated by all historians, though the story of Nūr-Jahān's early life told so graphically by Stewart and copied in the Gazetteer of Burdwan, is not quite accurate. Now the question is whether the tombs ascribed to Shir Āfgan and Qutbu'd-Din *Khān* really contain their bodies. According to the M'aāsiru'l-Umarā (Vol. III, p. 68) and the Memoirs of Jahāngīr, Qutbū'd-Din's body was transferred to Fathpūr-Sikri. What I think is that after their sudden death their dead bodies were temporarily interred at Pīr Bahrām, with a view to their being, later on, removed for burial to some other suitable place, and this may be the identical spot where Qutbu'd-

¹ According to the Iranians the word should be pronounced Āfkan.
 (افکن)

² The Bādshāhī road ran from Mednipūr through Burdwan to Rāj-mahal, and thence continued to Monghyr. At every 8 miles a mosque was built. The mosque at Burdwan according to the "Burdwan Gazetteer," p. 136, may be identified with that still attached to Pīr Bahrām Shrine.

Dīn was first buried beside his antagonist. There can be no doubt that Qutbu'd-Dīn's tomb at Burdwan is a spurious one. I do not know and think, if the unfortunate Shir Āfgan's body was similarly removed.

When appointing Qutbu'd-Dīn as Viceroy of Bengal, Jahāngīr let fall a hint that if Shir Āfgan, the Tayūldār of Burdwan and husband of the beautiful Mihru'n-nisā Begam, afterwards Nūr-Jahān Begam, was found to be dutiful and obedient, well, he should then be allowed to enjoy his office, or else he should be sent to His Majesty. When Qutbu'd-Dīn Khān assumed the charge of his office as Viceroy of Bengal, Shir Āfgan, being secretly informed, hesitated to see him. At last, to make a long story short, they met at a place near the Burdwan Railway Station called *Sadhanpur*. Before they met, Qutbu'd-Dīn gave a hint to his trusted Jamā'adārs that if he would raise his whip they should strike Shir Āfgan at once. When Shir Āfgan met Qutbu'd-Dīn, a crowd had gathered, on which Shir Āfgan remonstrated. Qutbu'd-Dīn ordered the crowd to disperse, walked a few steps and began to talk. It is supposed that Qutbu'd-Dīn, having seen the good behaviour of Shir Āfgan, had removed any bad feeling he might otherwise have entertained. But as he raised his hand to prevent men from crowding, his men thought that they had the expected hint. On this Shir Āfgan, suspecting treachery, drew his sword and inflicted a mortal wound on Qutbu'd-Dīn. Shir Āfgan too was struck by an attendant of the Governor.

The M'aāsiru'l-Umarā has it, that what Jahāngīr had spoken to Qutbu'd-Dīn Khān was communicated to Shir Āfgan by the latter's vakīl. From that day he gave up using *Yarāq* or arms and gave out to the officers that he was no longer in the employ of the Pādshāh. It is said that at the time of his departure to meet the Viceroy, his mother placed a *Dobalgha*, or helmet, on his head, and said, "*Butam* (or child), ere he makes your mother weep make his mother shed tears." It is also stated, though not supported by the *Iqbāl-nāma-i-Jahāngīrī*, that in spite of mortal wounds, the brave Shir Āfgan went to his quarters to kill his wife, to save her from disgrace. His mother said, weeping, that she had thrown herself into the well. Having heard this, he breathed his last. *Mazlūm* (oppressed) is the word that expresses the year of his death. (1016 H. = 1607-8 A.D.). A tradition reported to me by a friend says, that Nūr-Jahān, the real cause of the tragedy, took shelter, out of fear, in the house of Āshqa Jolaha, in Burdwan, and afterwards, in the house of Mīr Hādī at Bahādurpūr, some five miles north-west of Burdwan. Nūr-Jahān was sent to Jahāngīr's court from the latter place. It is doubtful that if there had been no grave apprehension on the part of the *Lion-Thrower*, and doubt on the part of the Viceroy, as to the former's loyalty, the unfortunate tragedy would not have been

enacted on the plain of Sādanpur, and Nūr-Jahān would have remained the dutiful wife of Shir Afgan.¹

The Āstāna and the tomb of Pir Bahrām "Saqqā" as well as the above two tombs have been repaired under the Ancient Monuments Preservation Act. I saw that the tombs of the Mutwallis and Khādims, too, are being repaired with marble. This was quite unnecessary. I agree with the very pertinent remark of Dr. Bloch, that "the ugly-looking modern tombstones marking the sites of the graves should be replaced by masonry tombs according to Muhammadan fashion, with marble tablets attached. The present tombstones would fit into an English Cemetery and are quite out of keeping inside a Muhammadan graveyard."²

III. THE TOMB OF KHWĀJA ĀNWAR-I-SHAHĪD.

This tomb is situated in a quarter of Burdwan, now called "Ber" (or enclosure) "of Khwāja Ānwar." There are two large gates leading to the garden, in one extremity of which the nobleman and his fellow-martyrs are buried, over whose tombs a superb Mausoleum was built. Between the gates and the Mausoleum there is a tank, on one side of which is a Mosque, and on the other a Maḍrasa. In the middle of the tank is a little pavilion, surrounded by narrow verandahs which is connected with a bridge on the side of the Mosque leading to the pavilion. I could discover no inscriptions on any of the buildings. It is seldom that one sees such a stately Mausoleum in Bengal so well preserved. It is strange to read, in the Annual Report of the Archaeological Surveyor, the following entry: "I have not been able to gather historical information about the Saint who lies buried there."³

The incident of the tragic death of Khwāja Ānwar is a well-known fact which took place in Burdwan during the Viceroyalty of Sulṭān 'Āzimush-Shāh, grandson of Emperor Aurangzib. As Aurangzib was long absent from his capital, and was engaged in fighting with the Muslim Rulers of the Dakan, and the Maharattas, rebellions and disturbances in outlying principalities of the Empire became common. During the Governorship of Ibrāhīm Khān, who was appointed in 1689, and who had no military talents, Sobhā Singh rose against Rāja Kishan Rai of Burdwan, who fell in a battle. His son, Jagat Rai, fled to Dacca and asked the help of the Governor. Sobhā Singh was joined by Raḥīm Khān, or Shāh, and his

¹ The Emperor Jahāngir married the widow (of Shir Afgan) some years afterwards, which gave rise to a legend of the Emperor having caused his death.—Beal's Oriental Biographical Dictionary, p. 380

² Report for 1905-06.

³ Report for 1903-04. Khwāja Ānwar is never known to be a Saint.

fellow-Afghāns. The country was in commotion, when the Emperor sent 'Azimush-Shān as Viceroy of Bengal, who came with his sons, Sulṭān Karimū'd-Dīn and Muḥammad Farrukh Siyar, to Bihar. Meanwhile, the brave son of Ibrāhīm Khān, Zabardast Khān, defeated Raḥīm. But the Prince did not recognise his services, with the result that Zabardast Khān left Bengal in disgust for the Dakan. Raḥīm Shāh, who was hiding, now came forward and made incursions on the frontiers of Burdwan, Hugli and Nadia. The Prince's march from Rāj-maḥal was slow and stately. At the approach of the Royal Army, Raḥīm Shāh pitched his camp in the outskirts of Burdwan. 'Azimush-Shān, who could displease Zabardast Khān, thought that to trap the Afghans was not difficult. He promised reward, if Raḥīm Shāh submitted; or vengeance, if he refused. Raḥīm Shāh sought an interview with the Prince's principal Āmir and companion, Khwāja Ānwar, representing that if that nobleman promised on oath and reassured his mind, he would come to His Highness in his company and seek pardon of the Royal Prince. In accordance with the Prince's order, Khwāja Ānwar proceeded with a few companions to Raḥīm Shāh's camp, and remaining on horseback sent word to the Afghān. Raḥīm requested that the Khwāja should enter his camp; but the Khwāja remained firm, and fearing treachery asked Raḥīm Shāh to come out and meet him. Raḥīm Khān with his hidden soldiers sallied forth and attacked him. The Khwāja with his followers fell of mortal wounds, though they defended themselves bravely. The wily Raḥīm then surrounded the Royal camp and attacked the Prince's elephant. The Royal troops having fled, the Prince was left in a corner. At this critical juncture, Hamīd Khān Quaraishī, who was near, attacked Raḥīm Khān with arrows; Raḥīm Khān fell with two wounds.

The above, in brief, is the account of the tragic death of the nobleman, Khwāja Ānwar, since called a "Shahīd" or Martyr. The Khwāja and his companions fell at a place outside the town of Burdwan, close to Ṣadr Ghāt. After his death, his uncle, Āmirū'l-Umarā Samsamū'd-Daula Khān Daurān Bahādur Maṅsūr Jang, and his brother, came to Burdwan. The Emperor Farrukh-Siyar, who must have been present as a Prince with his father at Burdwan, granted, in consideration of the Khwāja's services, Rupees 2,00,000 (two lakhs) in cash, and the Mauza "Poddarhāt," now called Khwāja Ānwar's "Bēr," for the construction of the Mausoleum with seven doors, over his remains and five of his companions, who fell with him. Besides this, five other Mauza's were granted for the purpose of maintaining the tombs. During the Permanent Settlement, the Mauza's were settled with the Maharājā of Burdwan, who pays to Government the amount fixed by them. There is no date on the tomb, but the Burdwan "Gazetteer" which apparently

quotes from the "List of Monuments in Bengal" gives 1127 H. (1715 A.D.) as the date of the building of the Mausoleum. The Chronogram of Khwāja Ānwar's death as I heard at Burdwan, is contained in the following Persian hemistich :—

آه انور شهيد اكبر شد (Āh Ānwar Shahid-i-Ākbar Shud). Alas!
Ānwar became the chief martyr.]

This gives 1109 = 1698 A.D.¹

IV. THE JĀMI' MOSQUE.

After his narrow escape, as mentioned above, Sultān 'Āzim-ush-Shān offered his devotion to Almighty God, and went to the shrine of Bahrām 'Saqqā' to pray. He distributed money to the poor and the pious. Having then entered the town he resided for three years in the Citadel of Burdwan, the residence of the Faujdār. Among other things he erected a Jāmi' Mosque, which I inspected on the 25th June 1916, for the prayer of the Muslim public. I found it surrounded by low buildings and huts, and a narrow road which passes along the south side of the Mahārājā of Burdwan's stately Palace. The Jāmi' Masjid has three domes in the centre, and four smaller ones, one on each corner. The following inscription is carved on a stone slab in front of the Mosque :

Text of the Inscription.

- | | |
|--|---|
| بسم الله الرحمن الرحيم | 1 |
| لا اله الا الله وحده لا شريك له وان | 2 |
| محمد عبده ورسوله لاحول ولا قوة | 3 |
| الا بالله العلي العظيم * وجعل الله فرق بين الكفر | 4 |
| والاسلام ط الصلوة والصوم في اوان * در | 5 |
| عهد همايون ابي المظفر سلطان محي الدين محمد | 6 |
| اورنگ زيب بهادر عالم گير بادشاه الغازي في سنة | 7 |
| 8 يك هزار و يكصد و يازده هجري قريب اختتام يافت * | |

The letters are badly cut, one line is running into another line. The sentence commencing from the words *وجعل* and end-

¹ Khwāja Ānwar's life is given in the *Riyāzu's-Salāṭīn* and by Charles Stewart. Other particulars I heard from the Mutawallis and Khādims of the Āstāna. *Vide* also List of Ancient Monuments in Bengal, Revised and Corrected up to 31st August, 1895: Calcutta, Bengal Secretariat Press, 1896.

ing with *اون في* has hardly any sense. In the 4th line *فوق* ought to have been *فوقا*.

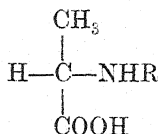
Translation.

In the name of God the Merciful, the Compassionate
There is no God but God, who is one, and verily there is no associate of Him, and Muhammad is his servant and Messenger.
There is no refuge and strength but in God, the high and exalted. And God made distinction between Unbelief and Islam (by) prayer and fastings at times. In the auspicious time of *Abi'z-zafar Sultān Muhy'ud-Dīn Muḥammad Āurangzib Bahādur 'Ālamgīr Pādshah'ul Ghāzi*, in the year of Hijri One thousand one hundred and eleven (this Mosque) was nearly completed (1111 H. = 1699-1700 A.D.).

13. The Stereochemistry of Alanine Derivatives.

By CHARLES STANLEY GIBSON AND JOHN LIONEL SIMONSEN.

The authors have for some considerable time been engaged on the stereochemical study of compounds of the type:—



where R is an acyl group, e.g., C_6H_5 , $\text{CO}-(\text{benzoyl})$, C_6H_4 , CH_3 , $\text{CO}-(\text{toluyl})$, C_6H_4 , CH_3 , $\text{SO}_2-(\text{sulphonyltolyl})$, etc. The reason for choosing these compounds was because they were all easily prepared, purified, and in most cases, beautifully crystalline: the latter being an important consideration since it is hoped to make a crystallographic study of the racemic and resolved compounds. The objects of the work are:—

1. To investigate more completely the methods of the resolution of externally compensated acids by naturally occurring optically active bases and, where possible, by synthetic bases, in ways which have been more clearly indicated by Pope and his co-workers and recently by the present authors, for the resolution of externally compensated bases.

2. To determine the effect of slight changes in the constitution of the group R, not directly united to the centre of asymmetry in the compound, on the optical rotatory power and dispersion, e.g., the effect of replacing the benzoyl by a toluyl group, etc. Most of similar previous work has been concerned with the effect of changing one or more groups directly attached to the centre of asymmetry.

3. To determine the effect of the replacement of $-\text{CO}$ by $-\text{SO}_2$ on the rotatory power.

4. To determine quantitatively the influence of the same change on the crystalline form of the racemic and optically active compounds.

In the case of externally compensated benzoyl alanine, Pope and Gibson have shown that different results are obtained according as the compound is resolved by using brucine and then strychnine, from when the bases are employed in the reverse order; whereas Gibson and Simonsen have shown more recently that in the case of externally compensated sulphonyl-p-tolylalanine, the compound could easily be resolved by the above two bases independently of the order in which they are

applied, the resolution being complete and quantitative in either case.

Sufficient evidence has not yet been accumulated to establish numerical relationships in connection with points 2, 3 and 4; but as far as the work has gone, it appears that increasing the mass of the group R, but keeping the nature of the group analogous, increases the rotatory power. When however $-CO$ is replaced by $-SO_2$ a distinct diminution in rotatory power takes place. It is obvious that, by investigating as complete a series as possible of these compounds, valuable information concerning the relationships between chemical constitution, rotatory power and dispersion will probably be obtained.

The most recent work we have had in hand has been in connection with the preparation and resolution of the externally compensated compounds, sulphonyl- β -naphthylalanine and sulphonyl-phenylalanine.

These compounds are of course readily prepared by means of the Schotten-Baumann reaction using a molecular proportion each, of alanine in the form of its sodium salt, the particular acid chloride and sodium hydroxide. The reaction product is crystallised in each case either from boiling water or from aqueous alcohol.

In order to effect the resolution of sulphonyl- β -naphthylalanine many experiments were tried using those methods which have proved so successful in the case of benzoylalanine and sulphonyl-p-tolylalanine, but without success. In every case it was found that the brucine salt could not be obtained crystalline. It was found possible, however, to isolate two strychnine salts having different rotatory powers. The method of resolution adopted was to mix together one molecular proportion of the externally compensated acid, half a molecular proportion of strychnine and an equivalent proportion of sodium hydroxide in standard solution. The whole was brought into solution in boiling water, and on cooling the strychnine salt crystallised out in colourless needles forming hard aggregates. This strychnine salt had after recrystallisation a constant specific rotatory power of $[\alpha] = -17.06$, and it was found to

Hg green

be the strychnine salt of the dextro acid. After separating off this strychnine salt the acid remaining in the mother liquor was isolated and was found to be laevorotatory. This acid was then combined with strychnine and the strychnine salt of the laevo-acid obtained. This strychnine salt had a specific rotatory power of $[\alpha] = -45.25$, but it probably consisted of a mix-

Hg green

ture of the salts, strychnine laevo-acid and strychnine dextro-acid, the latter, of course, being present in small quantity, but it was difficult to separate the two. Accordingly the acids were obtained from the strychnine salts in the usual manner and

converted into their barium salts, and these were recrystallised, until their rotatory powers were constant and equal and opposite. It will be seen from the above that the strychnine salt of the dextro-acid was obtained pure in the process of the resolution, so that the corresponding barium salt was easily obtained pure and its constants determined. It was analysed and found to contain half a molecule of water of crystallisation, and its molecular rotation was found to be $[M] = + 111.6$ for the mercury green line.

The impure strychnine salt of the laevo-acid, containing a small quantity of the strychnine salt of the dextro-acid, was converted into the barium salt and this was very carefully fractionated. After three crystallisations it had a molecular rotation of $[M] = - 109.0$ for the mercury green line, which approximates to the value obtained for the barium salt of the dextro-acid.

The barium salts crystallise from hot water in very long beautiful needles, and the two salts behave similarly in all respects to the usual chemical reagents. It is thus seen that sulphonyl- β -naphthylalanine has been resolved into its optically active components, and it is interesting to compare the molecular rotations of the salts sulphonyl-p-tolylalanine with those of the compound above described.

d and l-sulphonyl-p-tolylalanine $[M]_{5461} = \pm 81.9$.

d and l-sulphonyl- β -naphthylalanine $[M]_{5461} = \pm 110.3$.

These figures indicate clearly that increasing the mass of the group R has a very considerable effect in increasing the rotatory power.

The experiments on the resolution of externally compensated sulphonylphenylalanine have so far been unsuccessful, and it is interesting to observe that this compound which is no doubt very closely related to benzoyl alanine both in chemical constitution and crystalline form is not resolved in the same way as the latter compound.



14. A Progress Report on the Work done during the year 1916 in connection with the Bardic and Historical Survey of Rajputana.

By DR. L. P. TESSITORI.

THE NEW SCHEME.

The progress of the work during the year under report, has been on the whole very satisfactory, and thanks to the goodwill of the Government of India and the warm support of the Bikaner Darbar on one side and of the Director General of Archaeology on the other, arrangements have been made which will ensure the continuation of the Bardic and Historical Survey of Rajputana for a reasonable period, and eliminate all the difficulties and the uncertainties which had been handicapping the work during the last year. As mentioned in my last "Progress Report" (*Journ. As. Soc. of Beng.*, Vol. XII, No. 3, 1916, pp. 57ff.), I had left Jodhpur for Bikaner on December 6th, 1915, invited by H.H. the Maharaja of Bikaner, who had promised to employ me for a period of four months in the first instance, i.e. up to the end of March 1916, to examine the bardic and historical materials in the Darbar Library in the Fort, and suggest a plan for future work. Before the expiration of this period, I had completed a *Descriptive Catalogue* of the manuscripts of prose chronicles in the afore-mentioned Library, and submitted it to the Darbar, who on March 17th decided to entrust me with the compilation of a History of Bikaner and the publication of some of the most important bardic poems relating to this State. Accordingly, the Bikaner Darbar approached the Government of India desiring that my services might be lent to them for a period of one year more and offering to share in the expenditure involved.

Early in May, the Government of India sanctioned the grant towards my stipend for the year 1916-17, but in terms which left some doubt as to whether they would continue their assistance beyond the end of March 1917. Realizing that the support of the Government of India was essential for the success of research work to be carried out in a difficult field like the Native States of Rajputana, and knowing that the financial economy imposed by the present political situation was the chief and perhaps only reason why the Government of India were uncertain about the continuation of their assistance, I resolved to abandon the idea of an exhaustive survey as advocated in my big Scheme of 1914, and substitute for it a

reduced scheme, which by involving a much smaller expenditure and a much shorter period of years, would be better suited to the present circumstances. The outlines of this scheme for what may be called a "Summary Survey" of the Bardic and Historical Literature of Rajputana, were submitted to the Government of India in July, and were warmly endorsed by the Director General of Archaeology. The Scheme was approved, and in August arrangements were concluded by which the Government of India sanctioned a grant of Rs. 6,000 a year for a period of five years with effect from the 1st April, 1917, to be met partly from the reserve at the disposal of the Department of Education and partly from the Archaeological grant, towards the cost of my employment, independently of any contributions which would be made by the Native States of Rajputana.

The features of the new Scheme for a Summary Survey are briefly as follows. The Survey will leave out of consideration the smaller States of Rajputana, and apply to only the six principal States following: Bikaner, Udaipur, Jodhpur, Bundi (including Kota), Jaipur, and Jesalmer. Each of these States will be taken up in turn, and a year will be devoted to each of them. During this year, the Editor will have his head-quarters at the capital of the particular State with which he deals at the time, and explore the whole of the district as completely as possible in search for manuscripts, inscriptions and other antiquities; compile a Descriptive Catalogue of the most important bardic and historical manuscripts discovered, and publish some of the most interesting bardic poems relating to that particular State. No histories will be compiled, except in the case of Bikaner, which State will in consequence require two or more years instead of one. In return for the contribution made from the Archaeological fund, the Editor will be expected, within the sphere of his operations, to prepare for the Archaeological Department lists of the monuments in Rajputana, and to search for Sanskrit manuscripts, Rajput paintings, and other antiquities. In consequence of the new arrangements, the control over the Bardic and Historical Survey is transferred from the Asiatic Society of Bengal to the Agent to the Governor General in Rajputana, but the publication of the results of the Survey will be made by the Asiatic Society of Bengal in a separate section of the "Bibliotheca Indica."

The most encouraging feature of the year has been the enthusiastic support of the Bikaner Darbar. After intimating to the Government of India that they desired to retain my services for a period of one year, i.e. for the year 1916-17, in March, they again approached Government in September asking for a further extension of another year and a half. Other States have not yet been consulted, but in August the Udaipur Darbar, to whom a proposal had been submitted last year,

manifested a desire to obtain my services for a period of three months, and showed themselves willing to bear the whole expenditure of my employment. These symptoms are significant and indicate that interest is awakening, and leave no doubt that when their turn will come, all the States concerned will be equally ready to give all the assistance which is expected from them.

THE WORK DONE.

As it had not seemed desirable to initiate the operations of the Survey on their proper scale, previous to the conclusion of some definite arrangements between the Government of India and the Bikaner Darbar, such as would give assurance that the work could be continued and carried to completion, no assistants or other clerks were sanctioned during the first six months of the year, and all the work during this period was carried out by myself alone within the four walls of my office. The first appointment made was that of an assistant, and the man chosen was Bāratha Kiśora Dāna, whose services were lent to us, by the kind permission of the Jodhpur Darbar, on July 21st. The second appointment was that of a copyist, made on August 23rd, and continued up to the end of November, when the copying of manuscripts was temporarily suspended, as the greatest part of the winter months were to be devoted to touring, and copying could not be done under my supervision. The third appointment was that of a travelling man, and it was made on October 1st, in the person of Viṭhū Sitā Rāma, a Cāraṇa of Sithal, near Bikaner. The fact that a travelling man was employed for only the last three months of the year, and likewise a copyist was employed for only about three months, explains why the results of the search in the district, and of the copying of manuscripts, were much below what could be expected in normal years.

But the absence of subordinates during the first six months did not affect my editorial and research work, except in that my activity had to be confined within the limits of Bikaner City. The six months were spent by me in examining the bardic and historical manuscripts contained in the Darbar Library in the Fort of Bikaner, separating them from the other heterogeneous manuscripts with which they were mixed, and classifying the most important amongst them by means of two separate fasciculi of the *Descriptive Catalogue of Bardic and Historical Manuscripts*, the one (Sect. i, pt. ii) containing a description of the manuscripts of "Prose Chronicles," and the other (Sect. ii, pt. i), a description of the manuscripts of "Bardic Poetry." The most noteworthy discovery made in the afore-mentioned Library, were two bulky poems in *chandās* in honour of rāva Jēta Si—the third ruler of Bikaner—composed soon after the splendid victory he obtained over Kamran,

the son of Babar, in Samvat 1591. One of the poems is attributed to Sūjō Nagarājōta, a Vithū Cāraṇa, whereas the other is anonymous. The importance of these two works is enhanced by the fact that they contain an introductory part, in which an account is given of the principal events in the reigns of Vikō and Lūna Karana, and that they constitute the oldest document we have for the history of Bikaner from the time of Vikō, who founded Bikaner in Samvat 1545, to that of Jēta Si (Samvat 1591). The fact that there is only one single manuscript in existence of each of the two poems is in part compensated by the accuracy of the copies, and by their antiquity, both being dated in the Samvat century 1600.

The work which principally engaged my attention during the later half of the year, was a collection of the most interesting commemorative songs of the Rulers of Bikaner (*Vikānera rī Kavitā*), from rāva Vikō, the founder of the State, to mahārājā Colonel Sir Ganga Singh, the present Ruler. A small selection from the songs thus collected, is given in appendix to the present "Report." The songs will be published in a separate volume in the "Series of Bardic and Historical Texts," with critical notes, as usual, and the translations, if time will allow, may be published in another volume, with historical notes and introductions.

During the year, something has been done towards publishing the results of the Survey, but it is not the Editor's fault if none of the publications has seen the light yet. At the end of the year, there were three publications in the Press: the *Vacanikā Rāthōra Ratana Singhajī rī Mahesadāsōta rī*, Part i: Dīngala Text with Introduction, Notes, and Glossary, and the *Descriptive Catalogue of Bardic and Historical Manuscripts*, Section i, part i, fasciculus i, and Section i, part ii, fasciculus i. It is to be hoped that now that the Survey is placed on a more permanent footing, and there are no more financial or other difficulties in sight, the publishing will proceed more rapidly so that works prepared may go to Press at once, without being unnecessarily delayed.

The exploration of the district in search for manuscripts and inscriptions, was begun only from the 1st of October, with the appointment of a travelling man. The places explored by him during the three months October to December were: Hanumangadh (October 13th-17th), Desnok, Janglu and neighbouring villages (October 18th-29th), Surpura and neighbouring villages (October 31st to November 11th), Napasar, Morkhana and intermediate villages (November 13th-29th), Pugal (December 10th-20th). I began my touring on December 3rd, and visited: Desnok, Janglu, Parwa, Morkhana (December 3rd-8th), Kodamdesar (December 21st), and Nal (December 27th). A detailed report on my touring, the monuments inspected, and the inscriptions discovered, will be found below. As a result of

the exploration, a collection has been made of impressions of about 120 inscriptions.

In the villages explored no manuscripts were found, except two or three unimportant and recent copies. Two manuscripts were presented by the Jainācārya Dharma Vijaya Sūri, and six were purchased by myself at Jaipur and Bikaner. The works copied were 29 only, as against 68 copied during the last year. I give below a complete list of the manuscripts received (*R.*), purchased (*P.*), and copied (*C.*), in continuation of the list published in the "Progress Report" for 1915, pp. 60-73.

MANUSCRIPTS RECEIVED.

R. 17 : जलाल गहाणी री वात .

Size $4\frac{3}{4}" \times 10\frac{1}{4}"$. No. of leaves 27. Loose.

About 150-200 years old.

Presented by the Jainācārya Dharma Vijaya Sūri, January 1916.

R. 18 : धीरवचन प्रस्ताव प्रिथौराजरासा मायलौ .

Size $4" \times 10\frac{1}{8}"$. No. of leaves 18. Loose. Jaina.

Written in Samvat 1769.

Presented by the Jainācārya Dharma Vijaya Sūri, January 1916.

MANUSCRIPTS PURCHASED.

P. 17 : सुकनविचार री बत्तीसौ सांखलै हरभूजौ री कह्यौ .

Size $4\frac{1}{2}" \times 10"$. No. of leaves 1. Loose. Jaina.

Written in Samvat 1839.

Purchased at Jaipur, the 6th July, 1916.

P. 18 : किसन रुकमणी री वेलि सटौका .

Size $4\frac{1}{4}" \times 10"$. No. of leaves 30. Loose. Jaina. Illegible in several places owing to the bad quality of the ink which has caused the leaves to stick to one another. The *īkā* is in Old Western Rājasthānī.

Written during the Samvat-century 1600.

Purchased at Jaipur, the 6th July, 1916.

P. 19 : राजनीति रा कवित्त देवीदास रा कहिया .

Size $4\frac{1}{2}" \times 5\frac{3}{4}"$. No. of leaves 36, of which 7 blank. Jaina.

Written at Dihāvārī, in Samvat 1835.

Purchased at Jaipur, the 6th July, 1916.

P. 20 : गोपीचन्द कौ रास .

Size $4\frac{1}{2}" \times 9\frac{3}{8}"$. No. of leaves 2. Loose. Jaina.

About 100-150 years old. Copied by a Kesara Arajakā.

Purchased at Jaipur, the 6th July, 1916.

P. 21 : साठ संवत्करौ ग्रन्थ .

Size $4\frac{1}{4}" \times 10"$. No. of leaves 8. Loose. Incomplete at the end. Jaina.

About 200 years old.

Purchased at Jaipur, the 6th July, 1916.

P. 22 : तेगबेगखान रा दूहा .

Size $8\frac{3}{4}" \times 5"$. No. of leaves 13. Loose. Fragmentary.

About 250 years old.

Purchased at Bikaner, the 29th August, 1916.

MANUSCRIPTS COPIED.**C. 69 : कुतबदीन साहिजादे रौ वात, 10 leaves.**

From a MS. in the Darbar Library in the Fort of Bikaner [No. 142 (14)], written about Samvat 1731.

C. 70 : कुतब सतक, 13 leaves.

From MS. No. 15 (d) of *Descr. Cat.*, Sect. ii, pt. i.

C. 71 : गुणनोदायण गाढण पसायत रौ कह्यौ, 7 leaves.

From MS. No. 1 of *Descr. Cat.*, Sect. ii, pt. i.

C. 72 : खीचियाँ रौ वात, 15 leaves.

From MS. No. 29 of *Descr. Cat.*, Sect. i, pt. ii.

C. 73 : वगड़ावताँ रौ वात, 19 leaves.

From MS. No. 22 (iii) of *Descr. Cat.*, Sect. i, pt. ii.

C. 74 : राव रिणमल खाबड़ियै रौ वात, 17 leaves.

From MS. No. 22 (xv) of *Descr. Cat.*, Sect. i, pt. ii.

C. 75 : राव रिणमल रौ रूपक गाढण पसायत रौ कहियौ, 6 leaves.

From MS. No. 1 (d) of *Descr. Cat.*, Sect. ii, pt. i.

C. 76 : गाढण पसायत रा कवित्त, 6 leaves.

From the same MS.

C. 77 : पाबू जीँ दराव रौ कन्द वीठ मेहै रौ कहियौ, 5 leaves.

From MS. No. 2 (b) of *Descr. Cat.*, Sect. ii, pt. i.

C. 78 : सोढै राखै रायमल रा गुणगीत, 7 leaves.

From MS. No. 5 (b) of *Descr. Cat.*, Sect. ii, pt. i.

- C. 79 : जैतसौ रौ पाघड़ी कन्द वौट सूजे रौ कियो, 31 leaves.
From MS. No. 15 (i) of *Descr. Cat.*, Sect. ii, pt. i.
- C. 80 : अचलदास खीची रौ वचनिका, 13 leaves.
From the same MS.
- C. 81 : राव रियमल खानडियै रौ वात, 9 leaves.
From MS. No. 13 (q) of *Descr. Cat.*, Sect. ii, pt. i.
- C. 82 : वरसलपुरगडविजय, 7 leaves.
From MS. No. 19 of *Descr. Cat.*, Sect. ii, pt. i.
- C. 83 : ऊमादे रा कवित्त बारठ आसै रा कहिया, 4 leaves.
From MS. No. 13 (b) of *Descr. Cat.*, Sect. ii, pt. i.
- C. 84 : डोला माह रा दूहा, 26 leaves.
From MS. No. 12 (a) of *Descr. Cat.*, Sect. ii, pt. i.
- C. 85 : राव जैतसौ रौ पाघड़ी कन्द, 43 leaves.
From MS. No. 2 (a) of *Descr. Cat.*, Sect. ii, pt. i.
- C. 86 : राजा सूरसिङ्गजी वीकानेरियै रौ कविता, 18 leaves.
From MS. No. 6 (k) of *Descr. Cat.*, Sect. ii, pt. i.
- C. 87 : राजा रायसिङ्गजी रौ बेल, 4 leaves
From MS. No. 26 (m) of *Descr. Cat.*, Sect. ii, pt. i.
- C. 88 : राजा करणसिङ्गजी वीकानेरियै रा गीत, 31 leaves.
From MS. No. 6 (l) of *Descr. Cat.*, Sect. ii, pt. i.
- C. 89 : पँवार अखैराज राठौड़ रतनसिङ्गजी रा कवित्त,
5 leaves.
From MS. No. 22 (e) of *Descr. Cat.*, Sect. ii, pt. i.
- C. 90 : राठौड़ रतनसौ खौँवावत रौ बेल, 6 leaves.
From the same MS., (f).
- C. 91 : राठौड़ कूपै महिराजौत रा दूहा, 9 leaves.
From a fragmentary MS., written in Samvat 1713, in the possession of Kavirājā Āsiyō Gaṇesa Dāna of Jodhpur (pp. 108a-113b).
- C. 92 : बालीसा सूजा रा कवित्त, 12 leaves.
From the same MS. (pp. 150b-163b).

C. 93: जोधपुर रै राठौड़ा रौ ख्यात, 96 leaves.

From MS. No. 19 of *Descr. Cat.*, Sect. i, pt. i.

C. 94: राव गोयन्द रा कन्द, 4 leaves.

From MS. No. 18 (pp. 254a-256b) of *Descr. Cat.*, Sect. i, pt. i.

C. 95: राजा गजसिङ्गजी रा दूहा कविया पद्मायण (?) रा कहिया, 3 leaves (fragment).

From the same MS. as C. 91 (pp. 160a-161a).

C. 96: रावल माना रौ गुण बारठ आसा रौ कहियो, 7 leaves.

From MS. No. 18 of *Descr. Cat.*, Sect. i, pt. i (pp. 844a-850a).

C. 97: नौबा जोधावत रा दूहा, 4 leaves.

From the same MS. as C. 91 (pp. 156a-159b).

TOURING REPORT.

I. JĀGAḶŪ.

Jāgaḷū, the ancient stronghold of the Sākhalās, is about 10 miles south-west of Desanoka, a railway station on the Jodhpur-Bikaner Railway, the second from Bikaner. The place was visited by me on December 5th, 1916. Jāgaḷū had a political importance till about the time of rāva Vikò's colonisation, when it was incorporated into the domains of the great Rāthōra conqueror.

The best source of information for the traditions concerning the ancient history of Jāgaḷū is the Chronicle of Mūhaṇḍa Nēṇa Sī. In the chapter on the Pāvāras (*Vāta Pāvārā rī*), Nēṇa Sī describes the origin of the Sākhalās and the founding of Rūṇa, their first capital, near Mūdhiyāra. It was Rāya Sī, the son of Mahi Paḷa and grandson of the third rāṇò of Rūṇa, who emigrated from Rūṇa to Jāgaḷū and succeeded in establishing his sovereignty over the place. His descendants were called *Janḡalavā Sākhalās*, to distinguish them from the *Rūṇecā Sākhalās*, who continued to reign over Rūṇa.

According to a tradition preserved in a manuscript in the Darbar Library in the Fort of Bikaner (see *Descr. Cat. of Bard. and Hist. MSS.*, Sect. i, pt. ii, No. 2, pp. 37 a-b of the MS.), which dates as far back as the end of the Saṃvat century 1600, Jāgaḷū had been colonized by the Dahiyā Rajputs during the time of rājā Prithī Rāja, the Cahavāṇa ruler of Ajmer.

A certain Ajiyā De, daughter to Harò, a Dahiyò of Rīnò (?), was being escorted to Ajmer to be married to Prithī Rāja. On her way, she passed through the Jāgaḷū country, and, finding it uninhabited, resolved to populate it and caused there a fort to be built, which, after her own name, she called Ajiyāpura. Subsequently, rājā Prithī Rāja came to Ajiyāpura to hunt, and there met Ajiyā De, whom he took to Ajmer, whilst the Dahiyās who formed her escort remained in the fort she had caused to be founded. Fantastical as the above account is, there is one particular in it which is certainly correct, namely the mention of Ajiyāpura, or rather Ajayapura, as the old name of the capital of the Jāgaḷū country.¹ The correctness of this name is confirmed by the inscription in the Sivālaya of Jāgaḷū, which is described below. As for the means by which the Sākhalās succeeded in taking Jāgaḷū, or Ajayapura, from the Dahiyās, the account in the above-mentioned Bikaner Manuscript mainly concords with that in the Chronicle of Nēna Si. Rāya Si, the emigrator from Rūṇa, first established himself at Rāsīsara, a village about 10 miles north-east of Jāgaḷū. From Rāsīsara he directed his ambitious aims to the possession of Jāgaḷū, and found a precious instrument to his schemes in Kesò, an *upādhiyò* brahmin of the Dahiyās. Acting after the advice of this traitor, he sent to the Dahiyās cocoanuts to offer in marriage the Sākhalī maids, and when the Dahiyās accepted and came to Rāsīsara to be married, he intoxicated them with wine mixed with *dhatūrò*, and then slaughtered them all. According to Nēna Si another stratagem crowned the success of the fraud. Fifty covered carts, pretending to carry the brides, were taken to Jāgaḷū, and when the Dahiyā fathers opened the gate to give admission to whom they thought to be the brides of their sons, the purdahs on the carts were torn open, and out there came the Sākhalā murderers to massacre the fathers with the same swords with which they had massacred their sons. In this way Rāya Si made himself lord of Jāgaḷū.

Nēna Si gives the genealogies of the descendants of rānò Rāya Si as far as rānò Goyanda Dāsa, who represents the 15th generation. The names of the successors of Rāya Si are the following: Anakha Si > Khīva Si > Kāvāra Si > Rāja Si > Karama Si, Mūjò > Ūdò > Jè Singha, Puna Pāla > Mānika Rāva > Nāpò > Rāya Pāla > Surajana > Akhè Rāja > Isara Dāsa > Goyanda Dāsa. Kāvāra Si had married Bharamala, the daughter of a Kharalò chief ruling over a village 10 *kos* from Pūgaḷa and 15 from Vikūpura. Jè Singha

¹ In my "Progress Report" for 1915, pp. 85-6, I had connected the name *Ajayapura* and the legend of Ajiyā De with *Vijayapura*, the incorrect spelling in the Phalodhī inscription of rājā Prithī Deva, Samvat 1236. It seems, however, very doubtful that there should be any connection between the two names.

had a sister who was married to rāvaḷa Karaṇa of Jesalmer, whereupon Jē Singha himself emigrated to Jesalmer, and his descendants, at the time of Nēṇa Si, were still to be found at Sābō. Puna Pāḷa was killed in consequence of an expedition against Jāgaḷū, which Kānhò, the son of Cūḍò, the Rāthòra rāva of Mandora, undertook to punish the Sākhalās for the part they had taken in the killing of his father, as allies of the Multanis and of rāva Kelhaṇa of Pūgaḷa. The following *dūhò* records the names of Puna Pāḷa and his three brothers, who were killed with him:—

साँखल्ला ह्वा भला

गा भाने करजाल ।

वीरातन ऊदै विजौ

जब्बौ [नै *] पुनपाल¹ ॥ १ ॥

“Brave were the Sākhalās, [whereas] the fiend (?) fled; [and the names of the] valorous [are:] Ūḍò, Vijò, Jhabbò, and Puna Pāḷa.”

The fiend who fled is Kānhò himself, who after he had defeated the Sākhalās, was confronted by his brother Riṇa Mala and being unable to resist the fresh force brought up by the latter, had to retire into the Thālī. So the fruits of Kānhò's conquest were reaped by Riṇa Mala. Whether the latter succeeded or not in establishing an effective sovereignty over Jāgaḷū it is not known, but it is probable that when Riṇa Mala became lord of Mandora, his attention was too much absorbed in his vast domains of Marwar to allow him to care for Jāgaḷū and the Sākhalās. Certain it is that the sons of Puna Pāḷa continued to enjoy the territory of Jāgaḷū, though it may be that they recognized the supremacy of Mandora. The relations of Kānhò and Riṇa Mala with the Sākhalās have been made the subject of a legend in which Karanīji, the Cāraṇi deity of Bikaner, plays a prominent rôle, but I do not think it necessary to mention it here.

Nāpò, the son of Mānika Rāva and grandson of Puna Pāḷa, is perhaps the most famous name in the genealogies of the Sākhalās of Jāgaḷū. He was contemporary with rāva Vikò, the founder of Bikaner, and is believed to have greatly helped him to establish himself at Jāgaḷū and gradually conquer all the neighbouring territories of the Bhātīs, the Jāṭas, and the Mohilas, and thus found the great state of Bikaner. It is on

¹ MS. 19, of *Descr. Cat.*, Sect. i, pt. i, p. 29b. The Chronicle of Nēṇa Si has the variant:

सधर ह्वा भइ साँखल्ला

वीर रतन ऊदै विजौ

ग्यौ भाने क्राजाल ।

जब्बौ नै पुनपाल ॥ १ ॥

account of Nāpō's services, says Nēna St. that his descendants to this day enjoy the privilege of keeping the keys of the Fort of Bikaner.¹ In the later chronicles, Nāpō is represented as having devoted a great part of his life to the service of Jodhō also, and having given him invaluable assistance by staying at the court of Cītorā and sending him intelligence of all that the Rānā was scheming against him.

The few antiquarian remains which I have discovered at Jāgaḷū, tend to confirm, in part, the old traditions mentioned above. They were found in three places: the site of the ancient fort, the Kesolāi, and the Sivālaya, a modern little shrine of Mahādeva. The old fort was situated close to the modern village, to the north, and all that remains of it nowadays is an elevation in the form of a ring, enclosing an irregular circular or quadrilateral space. The elevation which evidently marks the place of the old wall enclosure, has four openings or depressions: one towards the east, one towards the south-west, and two towards the north-east, but three of these openings were probably cut by the rains, and only the fourth one, that facing the east, marks the place of the old *Purabiyo darvājō* of the fort. Walking along the crest of the elevation, which forms the periphery of the old fort, I have counted only about 800 steps. Traces of wall structures seem to be emerging on the surface of the ground at several points almost all around the elevation, but sure relics of the original wall enclosure were discovered by me near the old eastern gate, where I had the elevation dug a few inches, and a thick wall of baked bricks came to light. The bricks seen by me were from 8 to 13 inches long by $4\frac{1}{2}$ to 7 inches broad, and 2 to $2\frac{3}{4}$ inches thick. They were laid in stratus superposed one upon the other, and cemented with mud. In the middle of the enclosure of the fort there is a small elevation, which the local tradition identifies with the site where the kacerī stood. On the crest of the peripheral elevation, towards the south-east, there is a small inscribed *devālī* in honour of Khīva St. the third Sākhālō ruler of Jāgaḷū, in which he is represented as a *bhomiyo*, but it is a posthumous and quite recent monument.

The *Kesolāi* is found to the east of the fort and is a small pond cut into the hard *magarā* soil, without any masonry embankments and looking more like a natural hole than anything else. The legend is that Kesō, the *upādhiyō* brahmin of the Dahiyās, caused the *bhūtas* to dig it. In fact, the name of Kesō appears on a stone inscription on the brim of the *talāi*, and there can be no doubt that it is from him that the *talāi* has derived its name of Kesolāi. The inscription is incised on

¹ They were deprived of this privilege under mahārājā Sujāna Singha, when Sākhālō Dōlat Singha conspired to betray the Fort to Bakhat Singha of Nāgōra.

a *devālī* formed of a slab of red sand-stone without any mouldings, and consists of four lines of writing covering a space of 5½" high by 9½" broad. The record consists only of a date, *Samvat* 1349, the 14th day of the bright fortnight of *Śrāvana*, Thursday, and a name, *śrī Kesājī*, preceded by six *akṣaras*, whereof the meaning is not intelligible.

1. ओं^१ संवत् १३४९ आ -
2. वद्य सुदि १४ शुक्ल -
3. रे सो । (?) हरौआदत (?) श्रीके -
4. साजी ॥

What the subject of the record is, I am unable to say with certainty. But one thing seems certain, that the inscription tends rather to destroy the tradition that Kesò was contemporary with Rāya Śi and helped him to conquer Jāgaḷū. Rāya Śi must have lived long before Samvat 1349. Taking the pedigrees in the Chronicle of Nēna Śi to be correct, Rāya Śi was the great grandfather of Kāvāra Śi, or Kumara Śi, two sons of whom, according to the Rāsīsara inscriptions mentioned below, died in Samvat 1382 and 1386 (?) respectively. It would therefore seem that Rāya Śi must have lived towards the end of the Samvat century 1200.

Much more recent in time are five other *devālīs*, which are also found on the bank of the Kesolāī. The inscriptions on three of these are so badly engraved and so incorrect that they are entirely illegible, except for the dates which are Samvat 1618 (?), 1630, and 1664 respectively. They apparently record the death of some Bhātī *jagirdars* of Jāgaḷū, like the remaining two which are dated Samvat 1690 (?), and 1696. To this day, the *jagirdars* of Jāgaḷū are Bhātī.

The *Sivālaya* is a small shrine of Mahādeva, situated on the outskirts of the village towards the ancient fort. It is a modern construction and in no way artistic or interesting, except for a stone basement of a *līṅga* which is lying in the courtyard. The priest says that this was the original basement of the *līṅga* worshipped in the shrine, and he seems to be right, though the reason why the basement was changed is not apparent. The basement is in the form of a block of red sand-stone, and its only interest lies in a small inscription which is engraved on it. The inscription consists of 4 lines, and covers a space of about 16½" broad by 5" high. It is, unfortunately, so effaced that it is almost completely illegible, except for the word *पुत्रिका* in the second line, *रामदेवाः* (?) in the third, and *अजयपुर* in the fourth. The inscription seems to open with a date *चैः ८०६*, but such an early date is hardly possible, and it is

¹ Represented by a symbol.

probably something else which is meant instead. According to a small marble inscription set up in the enclosure wall over the entrance, the shrine, whose proper name was *śrī Bhavānī Śaṅkara prāsāda*, was first caused to be built by rāva Vikò, and then rebuilt by mahārājā Ratana Siṅha in Saṃvat 1901.

Jāgaḷū possesses three other small shrines, but these are also recent. One is dedicated to Jhābōjī, a Pāvāra of Mukām—a village about 26 miles south-east of Jāgaḷū and 21 south-east of Desanoka—who became a *sādhu*, and performed the *samādhi* in Saṃvat 1593.¹ He is worshipped by the Visanoīs. The little temple was built by the Visanoīs of Jāgaḷū about a century ago, and the special object of worship in it is a *colò*,² which is believed to have belonged to Jhābōjī.

There are two wells at Jāgaḷū and they have no inscriptions, but for a red sand-stone *devaṭī*, which has been built into the wall of one of them. The inscription on this *devaṭī* is much effaced and for a great part quite illegible, but the date संवत् ११७० [फा] बगुन बुदि १ (?) can still be read in the first and second line, and also the name पुच गचल (*sic*), in the fourth line.

2. RĀSISARA.

Rāsīsara is a village about 4 miles south of Desanoka, and about 10 east of Jāgaḷū. According to the tradition mentioned above, Rāsīsara was the first place where Rāya Sī, the Sākhālò, halted after leaving Rūṇa. As the name of the village is evidently derived from Rāya Sī, it seems reasonable to conclude that it was founded by him.

I have not visited Rāsīsara, but my traveller Sītā Rāma has done it for me, and has brought from there impressions of three *devaṭī*-inscriptions which he found near the well of the village. The oldest of these is dated in the year *Saṃvat* 1288. *the 15th day of the dark fortnight of Jaiṣṭha, Saturday*, and records the death of a Cahuvāna Vikrama Siṅha, the son of Lākhana. The inscription consists of 4 lines, covering a space of 9½" high by 14"–14½" broad.

1. ओं ^३ ॥ संवत् १२८८ जेष्ठ व-
2. दि १५ सनिवारे चौहाय
3. लाषण सुत विक्रम-
4. सीह देवलोके गत :

The inscription is important, inasmuch as it proves that the village was founded before Saṃvat 1288.

¹ This date was given me by the *pujārī*.

² A sort of coat worn by *sādhus*.

³ Expressed by a symbol.

The other two inscriptions refer to two sons of rānò Kāvāra Si, or Kumara Si, the great-grandson of Sākhalò Rāya Si, who died in Samvat 1382 and Samvat 1386 (?), respectively. Unfortunately, both the inscriptions are so badly preserved that they are in part illegible, and there is some doubt even in the reading of the names of the persons to whom they refer. Certainly the records do not refer to Rāja Si, who, if Nēpa Si is correct, was the eldest son of Kāvāra Si and succeeded him, but to two younger sons of Kāvāra Si. The older of the two inscriptions is engraved on a *devālī* in red sand-stone, under the sculpture of a horseman and three *satīs*. It consists of seven lines, covering a space of 7½" high by 18" – 19" broad. The record opens with the date [Vikrama-] Samvat 1382, corresponding to the Śāka-year 1247, Ajayapura, and then proceeds to mention that the S[ākhalò] Vikrama [Si] (?), son of Kumara Si, went to heaven together with his three wives, whose names cannot be deciphered.

1. ओं^१ ॥ स्वस्ति ॥ संवत् १३८२ श्राक्ते १२४७ व[र्षे] --- दि-]-
2. मौ वासरे (?) भोमवारे^२ त्रदिने श्रीअजयपुर ---
3. म - स[^{०*}] श्रीकुमरसौहात्मज स[^{०*}] श्रीविक्रम (?) सति]
त्रये
4. स[ि]हत स्वर्गलोके गत --- श्री - सु --- श्रीशो-
5. डपुत्री [दि]तीय --- [जां?]गजदेस (?) श्रीकोचरपुत्री
6. त्रितीय --- [श्री]सागा ---
7. ---

The other inscription is similarly engraved on a slab of red sand-stone, but the sculpture above represents only a horseman, without *satī*. This fact possibly indicates that the man in question died in his childhood. The inscription consists of five lines, covering a space of 9½" high by 15" – 16½" broad. It records that Pratāpa Si (?), another son of the same Kumara Si, passed to the other world in the year Samvat 1386 (?)

1. [-स्व]स्ति ॥ संवत् १३८[६] ---
2. --- (?) अत्रदिने [सां]मला (?)
3. माहारा[णा] (?) - कुम्भरसौह
4. सुत प्र[तापसौ]ह परमलोकां -
5. [तरित] शुभं भवतु .

^१ Expressed by a symbol.

^२ Or सो ?

3. JEGAḶÒ.

JegaḶò is about 6 miles south of Desanoka and 5 south-west of Rāsīsara. It was visited by my traveller on October 24th, 1916. The only old records in the village are two funeral stones, or *devaḷīs*, in memory of Gogaḷī chiefs. The older of the two is dated *Samvat* 1647, *Āsū vadi* 8, and refers to Gogaḷī Samsārò, a man who, according to the local tradition, served under rājā Rāya Singha and Prithī Rāja of Bikaner, and distinguished himself by performing, in the presence of the Emperor, the feat of fighting for a time after his head had been cut off. Gogaḷīs are found to this day at JegaḶò, and one of the two *jagirdars* of the place is himself a Gogaḷī.

4. PĀRAVÒ.

Pāravò is situated about 4 miles east of JegaḶò, and 3 south of Rāsīsara. It was visited by me on December 6th, 1916, on my way from Jāgaḷū to Morakhāṇò. The only object of interest in the village is a *chattrī* covering an inscribed stone recording the demise of Rāthòra Māna Singha, a son of rāva Jèta Si of Bikaner. The inscription consists of six lines, and covers a space of $4\frac{1}{2}$ " high by $10\frac{3}{4}$ " broad. It opens with the date *Samvat* 1653, the 4th day of the bright fortnight of *Āsāḍha*, Wednesday, and contains, beside the name of Māna Singha, also that of his wife, the Kachavāhī Pūnima De, who was burnt alive with the corpse of her husband.

1. ॥ श्रीगणेशाय नमः संवत् १६५३ वरषे आसाढ सु -
2. ॥ दि ४ दिने बुधवारि राठवडवंसे राजश्री राव ज्यत -
3. ॥ सीहजी तत्पुत्र राज मानसिंघजी बल्लजी कक्वा -
4. ॥ ह्री [पुनि]मदेजी महःसती सहतेभ्यः देवलोके
5. ॥ प्राप्त सुभं [भ]वन कल्याणमस्त सूत्रधार थीरदा -
6. ॥ सजी तत्पुत्र मांईदास घडत .

The *chattrī* is in the usual plain style, with four square columns. The cupola and the *chājò* are very dilapidated. The material is the ordinary red sand-stone.

5. GHATTŪ.

Ghattū was visited by my traveller on November 6th, 1916. The place is about 16 miles south-east of Desanoka, on a straight line. The only record worthy of notice in the village is a *devaḷī*-inscription dated *Samvat* 156., referring to a Devarò Teja Si.

6. Sovò.

Sovò, a village about 9 miles east of Desanoka, possesses three *devaḷī*-inscriptions dated Samvat 1662, 1668, and 1749, respectively. The first refers to Rāthōra Sāvaḷa Dāsa Hīṅga-lāvata, and the third to Sākhalò Deī Dāsa. The place was visited by my traveller on November 5th, 1916.

7. ŪDĀSARA.

Ūdāsara is about 17 miles south of Desanoka, on a straight line. The village was visited by my traveller on October 28th, 1916, and he brought from there impressions of six *devaḷī*-inscriptions, of which five dated Samvat 1727 (?), 1753, 1757, 1768, and 1777, and one illegible.

8. HIYĀDESARA.

Hiyādesara is about 13 miles south of Desanoka, on a straight line, and 5 miles north-east of Ūdāsara. It possesses seven *devaḷīs* with inscriptions dated Samvat 1610, 1674, 1742, 1750, 1750, 1752, and 1779, all referring to Pirohitas. The village was visited by my traveller, on October 29th, 1916.

9. MORAKHĀṆÒ.

Morakhāṇò is about 12 miles south-east of Desanoka, and 4 south-east of Sovò. I visited the place myself on December 7th and 8th, 1916, and found interesting records of the Samvat Century 1200, and also of the Samvat Centuries 1500-1600.

The chief object of interest at Morakhāṇò is the temple of Susānī, the *kuḷadevī* of the Sūrānās, a *gotra* of the Mahājanas. The Sūrānās derive their descent from the Sākhalā branch of the Pāvāra Rajputs. According to a tradition described in the *Mahājana Vamśa Muktaḷī* by Rāma Lāla Gaṇi,¹ the Sūrānās descend from Sūrò, a son of Jaga De, the well-known Pāvāra hero who lived at the court of Siddharāja Jè Singha, and is famous for the offer he made of his head to prolong the life of his master. The particulars of the conversion of the Sūrānās to Jainism are accounted for by Rāma Lāla Gaṇi in this way. On the occasion of a huge Kabuli force having fallen on Gujerat, Sūrò, who was an officer in Siddharāja Jè Singha's army, went to Maladhāra Hema Sūri and asked for his assistance. Hema Sūri first demanded as a condition that Sūrò and his brothers Sāvaḷa and Saṅkha should embrace Jainism, and the condition having been accepted, he gave them the *viḷayapatākā yantra*, by means of which they were able to rout the enemy. Thereupon Siddharāja Jè Singha welcomed Sūrò with the

¹ Bombay, 1910, pp. 45-7.

words: "*sābāsa sūrarānā*" ("well done, o prince of all the heroes!") and it is from this phrase that, according to Rāma Lāla Gaṇi, the term *Sūrānā* has derived. The story is, of course, an amusing fiction from beginning to end; and the only reasonable conclusion we can derive from it is that the *Sūrānās* were in origin *Pāvāra*, or more precisely *Sākhalā* Rajputs, who changed their name as they were converted to Jainism. Probably the term *Sūrānā* is derived from one *Sūrò*, who was converted, and the *Sūrānās* are his descendants.¹

As regards *Susānī*, the *kuladevī* of the *Sūrānās*, there is a tradition current at *Morakhāṇò* which is very interesting. *Susānī* was the virgin daughter of a bania of *Nāgōra*. She was very beautiful, so much that the Nawab of *Nāgōra* heard about her and fell in love with her. He asked her from her father. The father said that the girl was an incarnation of the *Mātāji*, and it was not in his power to bestow her on anybody. The Nawab got angry and threatened to obtain her by force, whereupon the girl fled into the desert to the north. The Nawab despatched a force in pursuit. The girl, fleeing alone, had reached the place where now *Morakhāṇò* is, when turning round she saw the men of the Nawab on the point of overreaching her. Seeing that there was no further escape, she went to a small shrine of *Mahādeva* that was on the spot and prostrating herself before the *līṅga*, asked the god to bestow on her his curse so that she might be destroyed and avoid disgrace. The god granted her prayer. She had proceeded only a little distance, where there stood a *kēra*-tree, and the men of the Nawab were on the point of laying their hands on her, when the *kēra* split in two, and she was absorbed into the earth between. The chasm which had opened in the earth, closed up again, but the two halves of the *kēra* remained disjoined and grew into two separate trees, and it is between these that the temple was subsequently erected. The trees are still to be seen at the two sides, close to the outer wall of the temple.

The temple rests on a high platform and consists of a cellar, open hall, and frontal porch. It is all built in *Jesalmeri* stone. The external walls of the cellar are carved with figures of deities and dancers, but the details of the carving have all been covered with whitewash. The doorway is likewise carved, but here also the particulars of the sculpture are in part hidden under a coating of vermilion and dust. The *śikhara* over the cellar is built hollow. The cellar contains a stone image of the goddess, apparently carved in the same style as the doorway. Round the cellar, there is a low wall, built in line with the outer wall of the hall, so as to form an

¹ Notice, however, that in a list of 92 Rajput *śākhās* contained in MS. 15 of Descr. Cat., Sect. i, pt. i, the name *Sūrānā* is also included.

open circumambulatory passage. The hall has a flat roof resting on sixteen pillars, twelve of which are peripheral and four central. The four central pillars and the two pillars in front of the cellar are of the *ghatapallava* style, i.e. characterized by the water-pot and foliage ornament, but the pattern of the two posterior central pillars differs somewhat from that of the other four. The peripheral pillars are of the *śrīdhara* style, but they are so overcoated with plaster that it is not possible to say whether they have any carvings or not. On one of the central pillars there is engraved the figure of a man in a sitting posture, which the local tradition identifies with the Nawab of Nāgōra. The floor of the porch is connected with the platform by a flight of eight steps.

The pillar in front of the cellar to the proper left is inscribed on two faces. On the frontal face it bears a small inscription of a single line, in part illegible, but evidently containing only a name, either of a donor or of some visitor. This is the following:—

1. सोनी^१ देवा फ (?) - ह -- (?) न - ॥ (?)

On the left face, it bears an inscription of three lines, covering a space of 3" high by 9½" broad. The inscription is dated in the year Samvat 1229, and refers to the temple of Susāṇevi, i.e. Susāṇī, but its precise object is not quite clear. The meaning of *bhoi* is unknown to me. *Lāhīni* (for *lāhina*, fem.) is used in MS. 12, (g) of *Descr. Cat.*, Sect. i. p. i, in the meaning of "public elargition (?)." Apparently, the inscription records some perpetual (*jāvaṇīva*) elargition made by a woman come from Sehalākota. As the inscription does not seem to contain the name of the donor, I wonder if she is to be identified with the Sonī Devā of the small inscription mentioned above. Possibly, the two inscriptions are connected with one another, and the one containing the name Sonī Devā simply represents the signature of the donor to the grant recorded in the other inscription. Above the latter inscription there is a sculpture representing a woman standing, evidently the donor herself. I give below the text of the inscription, which is in corrupt Sanskrit mixed with Bhāṣā:—

1. ओं^२ सं १२२९ श्री० देवा सुसाणेविचैवे सं-
2. प्राप्ती सेहलाकोट^३ आगतौ भो-
3. इच्छाहिण जावजीव देवि^४ अ - हितः^५

^१ For references to Sonī (Banias), see Jālorā Stone Inscription of Sāmanta Simhadeva, Samvat 1353, in *Ep. Ind.*, XI, No. 4, p. 61.

^२ Represented by a symbol.

^३ In this case only, the *e* is indicated by a *mātrā* placed before the *akṣara* in the archaic way.

^४ Apparently: दे०.

^५ Probably: आत्मा०.

Whatever the exact meaning of the above inscription, its chief value lies in the evidence it furnishes that the temple of Susānī was built previous to the year Samvat 1229. This is also borne out by the *devaṭīs* standing by the side of the temple, and described below. But the temple must have undergone important repairs in the Samvat Century 1500, as shown by another inscription, which is set up in the wall partition connecting the left side of the doorway with the pillar immediately in front. This inscription is on a slab of black marble, and consists of seventeen lines, covering a space 7½" high by 12½" broad. The only orthographical particular worth noticing in the inscription, is that *e* and *o* are indicated by a *mātrā* placed before the *akṣara*, after the archaic manner. The inscription consists of two parts: the first in Sanskrit verses, six in all, and the other in Sanskrit prose mixed with names in Bhāṣā. The first part opens with a homage to the *kuladevī* Susānī, then follow three verses in which Susānī is praised as the universal deity and the fount of all happiness to the *Surāṇa-vamśa* and her blessings are invoked (ll. 1-6). The next verse mentions a *śrī Bhūrīr Dharma Sūri* as having converted to Jainism the *gotradevī* of the *Surāṇa-vamśa* (ll. 6-8). The fifth verse is not completely clear, but refers to the *saṅgheśa* Śiva Rāja as having performed a pilgrimage, and having become the support of the *Marudharā*, i.e. Marwar country (ll. 8-10). The sixth and last verse contains a praise of Śiva Rāja's son Hema Rāja, and the statement that it was he who caused to be made "that shining temple of the *gotradevī*, similar to a chariot of the gods, with the beautiful lofty spire." The second part of the inscription contains the date [*Vikrama*] *Samvat* 1573, *the day of the full moon of Jyaiṣṭha, Friday*, and the information that the *saṅgheśa* Cāhara, the son of Pūjā, the son of Hema Rāja, the son of Śiva Rāja, the son of Gosala, of the *Surāṇa-vamśa*, together with a number of relatives of his, whose names are all given, caused the consecration (*pratisthā*) of the image in the repaired temple (?) to be performed by *śrī Nandi Vardhana Sūri*, the successor of *śrī Padmānanda Sūri*.

Considering that Cāhara must have been in his old age in Samvat 1573, for by that time his brother (?) Pātama De¹ and his cousin Śiha Mala had already had grandsons in the persons of *Devī Dāsa* and *Mokalā*, we can approximately fix the date of Hema Rāja in the beginning of the Samvat Century 1500. As regards the nature of the repairs which he caused to be made in the temple, it would seem—as is also borne out by the inscription itself—that they principally consisted in the re-

¹ This seems to be the name of a woman, but in the inscription it has the prefix *स्त्री*, meaning *saṅgheśa* or *saṅghapati*. Possibly *स्त्री* is wrongly written for *भार्या*, in which case Pātama De would be the name of Cāhara's wife, and *Devī Dāsa* would be a grandson of Cāhara himself.

building of the *śikhara*, and possibly also of other parts of the temple, which had fallen into decay. I give below the text of the inscription :—

1. ॥ ओं^१ ॥ श्रीसुसायकुलदेवै नमः ॥ मूलाधारनिरोधबुद्धफणिनी
कंदादिमंदानिले । [५*] नाक्रम्यग्रहराजमंड-
2. लधिया प्रागपश्चिमांतंगता । तत्राप्युज्ज्वलचंद्रमंडलगलत्पीयूषपानी-
हस्तत्कैवल्यानुभया सदास्तु जगदान-
3. दाय योगाश्वरी^२ ॥ १ या देवेन्द्रनरेन्द्रवन्दितपदा या भद्रतादायिनी ।
या देवी किल कल्पवृक्षसमतां नृणां दधा-
4. -^३ लौ । या रूपं सुरचित्तहारि नितरां देहे सदा विभ्रती । सा
सूराणासवंशसौख्यजननी भूयात्पृथ्विं^३ -
5. रौ ॥ २ तत्रैः किं किल किं सुमंत्रजपनैः किं भेषजैर्वावरैः । किं
देवेन्द्रनरेन्द्रसेवनतया किं साधुभिः । किं धनैः । ए-
6. का या भुवि सर्वकारणमयी ज्ञात्वेति भो ईश्वरी । तस्याध्यायत
पादपंकजयुगं तद्भानलौनाशयाः ॥ ३ ॥ श्रीभूरिर्द्धर्म-
7. सूरी रसमयसमयाभोनिधेः पारदृश्या । विश्वेषां शश्वदाशामुत्तरत-
सदृशस्त्याजितप्राणिहिंसां । सन्धगृष्टि^४ -
8. -मनगुणगणां गोत्रदेवीं गरिष्ठां^५ । कृत्वा सूराणवंशे जिनमत-
निरतां यां चकारात्मशक्त्या ॥ ४ तद्या^(?)चां
महतामहेन (?)
9. विधिवद्विज्ञो विधायाखिले निर्गमे मार्गगच्छातकष्टण^(?)गुणः सभा-
रटंककुटः । जातः क्षेत्रफले ग्रहिर्मरुधराधारा-
10. धरः स्थातिमान् संवेशः शिवराज इत्ययमहो चित्रं न गर्ज्जि-
ध्वजः ॥ ५ तत्पुत्रः सच्चरित्रे वचनरचनया भूमिराजः
11. समाजालंकारः स्फारसारो विहितनिजहितो हेमराजो महौजाः ।
चंगप्रोत्संगप्रदंगं भुवि भवनमिदं देवयानोप-

¹ Expressed by a symbol.

² Read ओगेश्वरी.

³ Read ओंछां.

⁴ The original reads कष्ट-

⁵ The original seems to have तथ्या^०.

12. मानं । गोत्राधिकृतदेव्याः प्रहमरकिरणं कारयमास भक्त्या ॥ ६
संवत् १५७३ वर्षे ज्येष्ठमासे सितपक्षे पूर्वामा-
13. स्यां शुक्ले [५*]नुराधायां षोमकर्णे^१ श्रीसूरायवंशे सं० गोसल
तत्पुत्र सं० शिवराज तत्पुत्र सं० हेमराज
तद्भार्या सं० हेमश्रीं त-
14. पुत्र सं० ध(?)जा सं० काजा सं० नाह्वा सं० नरदेव सं० पूजा
भार्या प्रतापदे पुत्र सं० चाहड सं०^२ पाटमदे
पुत्र सं० रणधीर (सं०
15. रणधीर)^३ सं० नाथू सं० देवा सं० रणधीर पुत्र देवीदास सं०
काजा [भा]र्या कउतिगदे पुत्र सं० सहसमल सं० रणमल
16. सहसमल पुत्र मांडण । रणमल पुत्र घेता^४ [षी]मा^५ । सं० नाह्वा
पुत्र सं० सौहमल पु[त्र] पौथा सं० नरदेव पुत्र मोकला-
17. दिसहितेन । सं० चाहडेन प्रतिष्ठा^६ कारिता सपरिकरेण श्रीपद्मा-
खंदस्वरि तत्पुत्रे भ० श्रीनंदिवर्द्धनसूरीश्वरेभ्यः [॥*] .

At the proper left side of the temple of Susānī, there is a group of stone sculptures, consisting of nine *devaḷīs* or *salī*-tablets, a *govardhana* or *kīrtistambha*, and an image of some deity. They are partly in red sand-stone, and partly in Jesalmeri stone. Unfortunately, the frontal faces of all these records, containing the sculptures and the inscriptions, have been almost completely covered by applications of vermilion, which in some places has formed an incrustation more than three inches in thickness. From the small portions of the stone that have escaped the obliteration by the vermilion, it appears that the nine *devaḷīs* belong to the beginning of the Samvat Century 1200, and probably all refer to Rajput Chiefs. All of them bear an inscription surmounted by a rilievo representing the particular Chief whose death they commemorate, on horseback, and his *satīs* standing at the left. In one case a *līnga* is visible, as in the *devaḷīs* of Ghaṅghānā.⁷ The inscriptions on the *devaḷīs* were very short and incorrect if we are to judge from

^१ Read खी०.

^२ Wrongly written for भार्या (?).

^३ The five *akṣaras* in brackets are a repetition probably due to a mistake of the engraver.

^४ Read खे०.

^५ Read खी०.

^६ Read °ष्टा.

^७ See "Progress Report" for 1915, pp. 104-6.

one which has been preserved entirely. This inscription is engraved on the left half of the stone and consists of 9 lines, covering a space of about 11" high by 8½" broad. It is dated *Samvat 1231, the 3rd day of the dark fortnight of Pausa* and records the death of a certain *rājaputra*, whose name and tribe is not decipherable, and the immolation of his three wives on his funeral pyre. The degree of corruption of the text in this inscription can be judged by the first three lines which I give below:

1. ॥ सं° १२३१ षोषे वदि ३
2. राजपुत्र° १ क्षी° (r) तलेको २
3. दिवलोवो ३ मत ४ तपनी ५

... ..

By far the most important of all these records was the *govardhana*, which is in red sand-stone sculptured on all its four faces. On the frontal face it bears an inscription in northern characters, which cannot be later than the *Samvat* Century 1100. The inscription consists of 12 lines, but unfortunately only a few *aksaras* towards the beginning of each line are readable, as all the rest is covered by a thick incrustation of vermilion. I tried to remove this with a chisel, but had to desist when I saw that fragments of the stone were coming off with the vermilion. From the few *aksaras* readable, I have not been able to make out the subject of the inscription. The image of the deity, which, as noted above, is found near the *devaṭīs*, is on a slab of red sand-stone, and is literally all covered with vermilion except for the feet below.

Other records, though not so important, are found near the *Sasiyānī Sāgara*, the well of the village. These consist of 26 small *devaṭīs* arranged on a line, all made of yellow Jesalmiri stone, except four which are of marble. A few *devaṭīs* are broken, and several inscriptions are illegible. All the *devaṭīs*, with only one exception perhaps⁶, refer to Bhāṭī jagirdars of the place, who died within the *Samvat* Centuries 1600 and 1700. Only one inscription is dated in the *Samvat* Century 1500, and this is the following:—

1. संवत् १५६४ बराधे फगण सुदी १४ भाटी वन घोव-
2. वत देवलोके भवन । कंवाराई राठवाडो जेराइ [ऊ?]-
3. लखी सती रऊई - - - - मा राठवाडो सुभं - -

¹ Read °व.

² Possibly for क्षी° तिलेको ?

³ Read °के.

⁴ Read ग°.

⁵ Read तप°.

⁶ An inscription dated *Samvat* 16..7, referring to a Kesava, son of Devō, son of Dūdō, of the *Kubhāra jāṭī* (*sic*).

One of the inscriptions, which is dated in the year Samvat 1695 (?), gives the name of Morakhāṇò as *Morakhiyānā gāma*. To the present day, the jagirdars of the place are Bhāṭī.

Lastly, there is in Morakhāṇò a Śivālaya, consisting of a shrine and *matha*, which is a recent construction and in no way interesting except for the tradition which identifies the *līṅga* worshipped in it, with the one near which Susānī sought protection and prayed to be destroyed. The Śivālaya and the temple of Susānī are the only *pakṛā* buildings in the village and will continue to remain so for very long, in homage to an injunction by the above-mentioned goddess that nobody should build a *pakṛā* house within the village territory. This explains why the *havelī* of the jagirdars of the place, though it was built very large at the cost of about ten thousand rupees, has walls plastered with mud like the poorest hut.

10. KODAMADESARA.

Kodamadesara is a very small village about 11 miles to the west of Bikaner. The place is famous for two things: the tank, which in the cold season is much frequented by grouse and bustards and only second to Gajanera in celebrity, and the fetish of Bhērū (Bhairava), which is installed on the bank of the tank and is believed to have been brought from Mandora by rāva Vikò himself when he first came to establish himself in the Jāgalū country. I visited the place on December 21st, 1916, and found four inscriptions with dates ranging from Samvat 1516 to Samvat 1630.

The oldest of the above-mentioned inscriptions is engraved on two faces of a *kīrtistambha* in red sand-stone, which is extant on the eastern bank of the tank, not far from the image of Bhērū. The *kīrtistambha* has four faces with different sculptures carved on each of them, to wit: Gaṇapati towards the east, Viṣṇu (or the Sun ?) towards the south, Brahmā (?) towards the north, and the figure of a woman, perhaps Pārvatī, in the act of worshipping a *līṅga*, the emblem of Mahādeva, towards the west. All the figures are standing, even that of Gaṇapati. The inscription is engraved on two faces of the stone, i.e. half on the northern and half on the western face, under the figures. The first part of the inscription consists of seven lines covering a space of $5\frac{1}{2}$ " high by $6\frac{1}{2}$ " broad, and the second part consists of five lines, covering a space of 4" high by $7\frac{1}{2}$ " broad. The characters are effaced in many places, especially in the first part of the inscription, where the stone is also broken in two places. The inscription reads as follows:—

1. सं.त १५१६ [वर्ष] साके १३८२]

2. प्रवर्त्तमाने: [-मह]मांगल्य

3. भाद्रवा सु[दि -] सोमदिने
4. हस्तनि[क्षत्रे] सुक[ल]जोगे
5. [कौ]खव[करणे] - - - - र (?)
6. - राठ[ड¹ म]हाधिरा(?)य श्री
7. रा[य अ]ीजो(?)धा

1. राय(?) श्रीरिणमल सु[त ?] त[ड]ा-
2. उ पत्रि(?)स्टा² कारता । (?) माता
3. श्रीकोड(?)मदे र[ि]नमति(?) कौ-
4. रतिस्तंभ य[पि?]ताः । सु-
5. भं भवतूः । कल्य(sic)णम (?) -
6. क्त [॥*]

The inscription records that in the year *Samvat* 1516, corresponding to the *Śāka* year 1382, the ... (?) day of the bright fortnight of *Bhādrava*, Monday, under the Hasta asterism, in the *Sukla yoga* and the *Kaulava karana* . . . , the *Rāthōra mahādhirāya* Jodhō, the son of *rāya* Rīna Mālā, caused the *talāva* to be consecrated and the *kīrtistambha* to be erected for the sake of his mother Koḍama De. The importance of the record is all in the mention of *rāva* Jodhō and of Koḍama De, who, in contrast with the tradition current in Bikaner, is here clearly and explicitly described as his mother. It is evidently from this Koḍama De—the mother of *rāva* Jodhō—that the tank, and hence the village, have derived their name. The information thus supplied by our inscription finds confirmation in some of the oldest chronicles of Jodhpur. In MS. 9 (b) of *Descr. Cat.*, Sect. i, pt. i, at p. 9b, it is clearly stated that *rāva* Jodhō was born of a Bhatiyānī mother, her name Koḍama De, who was a daughter of *rāva* Rānaṅga De of Pūgaḷa. The same information is found in the Jodhpur chronicle known as the *Mūdhīyāra rī Khyāta*. Rānaṅga De is a well-known name in the chronicles of Jesalmer, Jodhpur, and Bikaner. He was contemporary with *rāva* Cūḍō of Nāgōra, and died without male issue, his only heir Sādō having been killed by Cūḍō's son Aṛaka Mālā. After Rānaṅga De's death, the *gaddī* of Pūgaḷa was usurped by Kelhaṇa, a son of *rāva*ḷa Kehara of Jesalmer, and has ever since remained in the hands of his descendants, known after him as Kelhaṇa Bhātīs.

¹ Read राठोड़.

² Read प्रतिष्ठा.

As regards the circumstances under which the *talāva* of Koḍamadesara came to be called after the mother of Jodhō, we can only make conjectures. The easiest explanation, which suggests itself and is less inconsistent with the local tradition, is that Koḍama De must have immolated herself on the bank of the *talāva*. We know from the chronicles, that the other wives of rāva Rīṇa Mala, as soon as they heard of their husband's assassination at Cītorā, burned themselves in a unique pyre at Sojhata. Some of the chronicles give their names¹ and amongst these there is not Koḍama De. Evidently, she was not at Sojhata at the time. If we are allowed to make a conjecture, it is not unreasonable to suppose that she had gone to her paternal home in Pūgaḷa, and whilst there she heard of her husband's death, and went to the *talāva*, which now bears her name, and burned herself. Possibly, she heard the news on her way from or to Pūgaḷa, when halting at Koḍamadesara, and burned herself on the spot. Koḍamadesara is just on the road from Pūgaḷa to Maṇḍora. Rāva Jodhō must have visited the place soon afterwards, for the *Mūdhīyāra rī Khyāta* and other chronicles say that it was at Koḍamadesara that he performed the *bāriyō* or funeral ceremony of the 12th day, after the death of his father. As a matter of fact, Jodhō took refuge in the Thaḷī, after fleeing from Cītorā the night when Rīṇa Mala was assassinated, and stopped at Jāgaḷū, Koḍamadesara, and Kāhūni.² It was not on this occasion, however, that Jodhō caused the *kīrtistambha* to be set up in honour of his mother, at Koḍamadesara, but only

¹ The names are recorded in the following *dūhō*:—

रूपा रघव माणकदे	राणी अपन उभेव ।
त्रिभुवनदे सारंगदे	नाभल देवलदेव ॥ १ ॥

(*Mūdhīyāra rī Khyāta*).

Cfr. also:—

सोभित खरज साख	खर मंडल भेदे सती ।
देवी पतिव्रत दाख	राणी नव रिणमाल खं ॥ २०० ॥

(*Amara Singhajī rā dūhā, Bārathā Narahara Dāsa rā kahīyā*).

² Cfr. वहि हाजो आको वहै वहि नरहो रिणताल ।

जोधो आयो जांगलू	महाजन उचालू ॥ १ ॥
-----------------	-------------------

(*Descr. Cut.*, Sect. i, pt. i, MS. 19, p. 101b).

And also:—

मिल दल मेवाड़ा	माथे मण्डोवर धणी ।
आरभ कर आयाह	हे गै चतुरङ्गिण हिले ॥ २०१ ॥

...
देखे जोधे दाउ	सहवर लघु वेसा सल्ल ।		

रजधानी तजि राउ	कमधज थलि पेठी कहर ॥ २०२ ॥
----------------	---------------------------

(*Amara Singhajī rā dūhā, Bārathā Narahara Dāsa rā kahīyā*).

many years afterwards, i.e. after he had redeemed Marwar from the usurpation of Cīṭora, and even founded Jodhpur in Samvat 1515.

My own explanation of the name Koḍamadesara, however, is still more simple. The chronicles say that rāva Jodhō, after his escape from Cīṭora, being unable to recover Maṇḍora for the time, retired to Kāhūnī and resided there for many months if not for years. Now, Kāhūnī is only seven miles from Koḍamadesara. It is not improbable that, while at Kāhūnī, Jodhō thought of having the *talāva* of Koḍamadesara excavated or rather enlarged—for the depression is apparently a natural one—and having it named after his mother to perpetuate her memory. Whether the excavation was actually begun during Jodhō's stay at Kāhūnī, or only afterwards, we cannot say, but certain it is that the *talāva* was inaugurated only in Samvat 1516, as proved by the inscription. Thus the connection of Koḍama De with Koḍamadesara would be only an idealistic one. The fact that Koḍama De was not amongst the *satīs* of Rīṇa Mala, probably indicates that she had died a natural death some time before her husband's assassination.

Much more romantic, if not accurate, is the tradition concerning Koḍama De, which is current in Bikaner. This has, I think, originated from a confusion of the mother of Jodhō with a daughter of Mānika Rāva, the Mohila ruler of Chāpara. According to the *Khyātas*, Mānika Rāva had betrothed his daughter to Sādō, or Sādūla, the only son of Rānaṅga De, the Bhātī rāva of Pūgaḷa. Rānaṅga De had dissuaded his son from accepting the hand of the girl, because to go to marry at Chāpara, he would have had to pass through the country of his enemies, the Rāthōras, who from their stronghold of Nāgōra were watching for the first opportunity to revenge an old feud they had with the Bhātīs of Pūgaḷa. But Sādō did not listen to his father's advice, and went to Chāpara, and married the girl. On his way back to Pūgaḷa, however, he was waylaid by Araka Mala, the son of Cūḍō, and in the struggle lost his life. The Mohila maid, whom he had just married and whom he was taking home with him, cut one of her arms and threw it in the middle of her husband's pyre. Then she proceeded to Pūgaḷa, where she showed her face to her father- and mother-in-law as the custom requires, and afterwards immolated herself in the flames, to follow her spouse into the other world. This is the story, which evidently has nothing to do with our Koḍama De. Besides, the name of Sādō's bride is not given in any of the chronicles and she is simply spoken of as "the Mohila maid." It is probably this circumstance that has made possible for the Bikaneri tradition to identify the Mohila *satī* with Koḍama De, and blend the story of the latter with the story of the former, thereby creating the legend that Koḍama De was a daughter of Mohila

Māṇika Rāva who was married to kāvara Sādò of Pūgaḷa, and that she became *satī* on the spot where her husband was slain by Araka Mala. The *talāva* of Koḍamadesara, according to this legend, was dug from the proceeds of Koḍama De's bangles and named after her to perpetuate her memory. As regards the connection of Koḍama De with rāva Riṇa Mala, it is interesting to note that the Bikaneri legend indirectly admits it by representing her as having been betrothed to Riṇa Mala before being married to Sādò. Curiously enough, the later Bikaneri chronicles have lost any notion that the mother of Jodhò was a Bhatiyāṇī Koḍama De: the *Khyāta* of Dayāḷa Dāsa, for instance, believes that Jodhò was born of a Paṛihāra Haṃsamati.¹

Thus Koḍamadesara was founded by rāva Jodhò in Samvat 1516. Needless to say, the excavating of the tank and the founding of the village were simultaneous, and the reason is obvious to anybody who has any knowledge of the conditions of a village in the desert, which cannot exist without a tank or well. The fact that a great number of names of villages end in *-sara*, meaning "tank", is significant enough. The village, as founded by rāva Jodhò, was undoubtedly much larger and more important than the present village is, and the place must have possessed some attractions, for all the chronicles agree in stating that when rāva Jodhò's son Vikò came to colonize the Jāgaḷū country, he first chose Koḍamadesara as the best place to build a fort, and actually started building it and would have established his capital there, if it was not for the opposition raised against him by the Bhātis of Pūgaḷa. It was only in consequence of this opposition, according to the chronicles, that rāva Vikò left Koḍamadesara and went and built his fort on the spot where now Bikaner is. Whether the above account by the chronicles is accurate or not, it is difficult to say, but the villagers of Koḍamadesara still point to the visitor a long mound of earth running in two perpendicular directions, to the north-east of the *talāva*, and identify it with the remnants of rāva Vikò's fort. In fact, on the top of the elevation, there are in places some traces of a *pakkā* wall.

The other three inscriptions, which I have found at Koḍamadesara, are of little interest. The oldest of the three is incised on a marble *devaṭī*, preserved in the house of the Sādhu jagirdar of the place. It is dated *Samvat 1529, the 5th day of the bright fortnight of Māgha, Monday*, and records the death of a sāha Kapā (?), son of sāha Rūdā (?), and his wife the *satī* Kaūtiga De. An interesting particular in this inscription is that it gives the name of the village as Koḍamadesara (*Koḍamadesara madhye*). The second inscription is on a red sandstone *devaṭī* near the mound of the old fort, and records the

¹ *Descr. Cat.*, Sect. i, pt. ii, MS. 1, p. 123a.

death of some Rajput, apparently R[āthōra] Me[gha] Dāsa, which took place in *Samvat* 1542, the 7th day of the bright fortnight of *Bhādrava*, Monday. He was likewise burnt with his wife, a *Guhilōta*. Lastly, the third inscription is on a yellow-stone *devālī* on the bank of the *talāva*, and records that in *Samvat* 1630, the 13th day of the dark fortnight of *Bhādrava*, Tuesday, the Saṅgharāva Jivō died and was burnt together with his faithful wife, the Rāthōri Rūpāyī. I give below the text of this last inscription, which consists of only 5 lines covering a space of 7" high by 8" broad :—

1. संमत १६३० वर(१)षे
2. भादवा वदि १३
3. मंगलवारि संवरा-
4. व जीवा सेते सती ह-
5. पांथी राठवडि:

11. NĀḶA RĀ KŪĀ.

The locality of the *Nāḷa rā kūā*, "the wells of Nāḷa", is found about six miles west of Bikaner city, near the bifurcating of the metalled road which leads to Koḍamadesara and Gajanēra, and two miles south of the homonymous village of Nāḷa. I visited the place on December 27th, 1916, and took impressions of seven inscriptions whereof, six belonging to the *Samvat* Century 1600, and one to the *Samvat* Century 1700.

The places of interest on the spot are four, to wit: the group of the shrines, the two wells, and the site of the old *talāva*. The shrines comprise different buildings surrounded by a wall enclosure; the most noteworthy are two: a temple of Pārśvanātha, and a small shrine of Dādūjī. Both are comparatively recent constructions in red sand-stone, probably erected towards the end of the *Samvat* Century 1700. The temple of Pārśvanātha has a marble image, at the foot of which there is an inscription of two lines so incorrect and so badly engraved that I have been able to read only a few *akṣaras* in the beginning, containing the date:—

संवत १८५७ बौध बैसाख सुदि ७

The shrine of Dādūjī contains nothing of interest. At its side there is a *chattrī* in red sand-stone, but all covered with plaster. It is also dedicated to Dādūjī and covers, I was told, the foot-prints of the saint. In front of the temple of Pārśvanātha there are two *devālīs* in yellow Jesalmiri stone: one of the two represents a horseman and a *satī* and contains an inscription dated *Samvat* 1603 referring to Bhāṭī Gopāla Dāsa

Bhānidāsōta. The inscription is fragmentary as the stone is broken just under the third line. It reads as follows :—

1. संवत् १६०३ वर्षे पागु-
2. ग्ग बद १ भाटी गोपालदा-
3. स भानीदासत महास-
4. [ती]

A short distance from the same temple, near the wall enclosure, there stands a *kirtistambha* formed of a plain block of red sand-stone, without any mouldings of any kind. It bears an inscription dated *Samvat 1681, the twelfth day of the bright fortnight of Māgha (?)*, and recording that on that day, under the victorious reign of mahārājā Sūra Singha, the consecration took place of a *chattri* (?) made by the *sūtradhāra* Dedò Nībāvata (?). The *kirtistambha* has been evidently removed from its original place, for there is no *chattri* near it to-day. The inscription consists of 15 lines, covering a space of 12" high by 6½" broad :—

1. ॥ श्रीं^१ ॥ श्रीगणेशाय नमः ॥
2. ॥ अविरलमदजलनिव ॥
3. ॥ हृन्ममरकु --- सेवित-
4. [॥] कपोल --- फलदा ॥
5. [॥] तार - - - - -
6. [१॥] (?) संवत् १६८१ वर्षे मा (?) -
7. घ(?) मासे शुक्लपक्षे द्वादश्यां ति-
8. [थ] सोमवासरे घटी १३।६-
9. मृगशिरानक्षत्रे घटी १८ ।
10. १३ (?) उपेक्षनाम्नि योगे घटी १।२८
11. अत्र दिने महाराजाधिरा ।
12. ज महाराजा श्रीश्रीर सूर-
13. सिंह विजयरा[ज्ये] सूत्रघा-
14. [र] देदा नी[बा?]वत कृत्री (?) प्र-
15. [ति]ष्ठ[तं ॥] शुभं भ[वतु] ॥

^१ Expressed by a symbol.

The two wells are situated side by side, and each of them has a *kīrtistambha* near by, bearing an inscription referring to the digging of the well. The *kīrtistambha* of the older well is in yellow Jesalmeri stone, with ordinary carvings on the four faces. The figures are: Gaṇeśa facing the west, the Mātāji facing the north, the Sun facing the south, and a figure without characteristic emblems facing the east. The inscription is under the figure of Gaṇeśa and consists of 18 lines, covering a space of 19" high by 9½" broad. It is very badly preserved and in great part completely illegible. From the portion of the inscription that has been preserved, it appears that the well in question was dug during the reign of rājā Rāya Siṅha, and inaugurated the *eleventh day of the bright fortnight of Phālguna, of the year Samvat 1650 (?)*. I give below the portion of the inscription, which I have been able to read or reconstruct :—

1. ॥ ओं^१ ॥ श्रीगणेशाय नमः ॥ [ख]त्ति श्री-
2. मति(?) वसुरे खशर[भूर(?)समि]ते(?)] षाष्ट्य-
3. नैकादश्यन्दि सि[तपक्षे] — — — योमे
4. तथा शोभ[न — — —]ति राय[—]
5. नृपतो.....
6. रय.....
7.
8.
9.
10.
11. मासे शुक्ल[पक्षे].....[ति-]
12. थौ । वृहस्प[तिवा]रे । पु[ष्यनक्षत्रे] शो-
13. भन[नाम्निया]गे । अत्र रि[ने] महाराजा-
14. धि(r)रा[ज ?] महारायश्रीराय[संह] — —
15.
16.
17. — — — कुप[प्र]तिष्ठा कारि[त] — — — — — (?)
18. — — । थि^२ भवत्र^२ । ॥ श्रीरख ॥

^१ Expressed by a symbol.

^२ For ॐ.

On the other side of the same well, there is a double compound *chattri* of the usual quadrangular form, i.e. with two cupolas resting on six pillars, but it has neither *devaḥis* nor inscriptions whatever.

The *kīrtistambha* of the second well is in red sand-stone and has no mouldings of any kind, except for the apex, which is roughly carved in the shape of a lotus. The inscription is engraved in huge and deep characters on the eastern face of the stone. It consists of 24 lines of writing, covering a space of $29\frac{1}{4}$ " high by $10\frac{1}{4}$ "— $10\frac{1}{2}$ " broad. It records that the well in question was dug by Indra Bhāṇa, the son of Gopāla, and his two wives—a Sākhalī and a Rūpāvata—at the total expense of Rs. (?) 9,001¹, and inaugurated *the 8th day of the bright fortnight of Jaiṣṭha, of the year Samvat 1756*. The tribe of Indra Bhāṇa is not specified, but from a *satī*-inscription referring to him, in the village of Nāla (see below), we know that he was a Vāghora and died in Samvat 1762. Again, from a list of the *jāgirs* of Bikaner, contained in MS. No. 13, of *Descr. Cat. of Bar. and Hist. MSS.*, Sect. i, pt. ii, p. 17b, we derive the information that he was the holder of a *jāgīr* which comprehended Nāla, Devarājasara, Gusāisara, Ūnāva, Dhīradeyāṇī, and Dehō. The Vāghoras are a branch of the Sonigarā Cahu-vāṇas, and to this day the *jāgīr* of Nāla is held by them. The inscription is given below :—

1. ॥ स्वस्त श्रीगणेशाय कुलदेव्या
2. प्रशारेता^२ आसा पूरी । अभिप्रेता-
3. र्थसिधर्त^३ पूजतो जस सरीर पर्सक (?)
4. विघ्नक्केद तस मई श्रीगुणाधपते न-
5. स । अथ शुभसंव[त्सरे ?]^३ स्निग्ध श्री-
6. मन् श्रीमन् नृपते विक्रमादि-
7. ताराज्यात । सं १७५६ सालव-
8. हनराज (*sic*) १६२१ प्रवृत्तमाने म-
9. हामंगलप्रद । जेष्ठमासे शुक्ल-
10. पक्षे: तथे अष्टमी भृगुवारः घ. २३
11. पूर्वफाल्गुनी: घ. ३ । उत्तरा ऋ-

¹ Understand 9,000; the 1 is often added to round figures simply for the sake of good luck.

² For ०न । (?)

³ The original seems to read ०पर० (!).

12. लुगनाः घ[.] ५६ सि ४७ ऐत पंचंग
13. श्रीधराज श्रीश्रीश्रीगोपालजी
14. पिता । मात श्रीसायजी अगारदे-
15. जी ततपुत्र राजश्रीश्रीश्रीइंद्रभा-
16. गजी वृहजी श्रीसायलीजी व-
17. हजी श्रीरुपावतजी कृपी पते-
18. छा करावतं [*] शुभं भवत १ सुत-
19. धार राघो लिषमो द्र(?)रोगो हर-
20. जी सुसरप माणक ॥ १ ॥
21. ६००१ लागो कृप ना श्रीपर-
22. मेसरजी लेषा लिषतं सुत्र-
23. धार रामचंद ॥ ' ' ॥

On the site of the old *talāva*, which nowadays is separated from the modern *talāva* by the metalled road leading to Gajānara and Kōdamadesara, there is a *chattrī* of the usual quadrangular style, without any inscription, and a *kīrtistambha* near by. The *kīrtistambha* consists of a plain block of red sand-stone, and has no mouldings of any kind. The inscription is on the eastern face of the stone, and consists of 7 lines covering a space of 8 high by 10½" broad. The characters are much effaced; especially in the centre, and in places illegible. The object of the inscription is to record that the *talāva* was caused to be dug by¹, the son of Rāma, and inaugurated the second(?) day of the dark fortnight of Vaisākha of the year Samvat 1659:—

1. संवत् १६५[६?] वरषे वैसा[ख?]मा-
2. से कसनप[क्षे] [तिथि] दि(?)तीया(?)य
3. शु(?)स्वारे अनरा[धानक्ष]त्रे वि-
4. कुंभजोगे ----- इय
5. रामा सुत तलाव पति[छा] क-
6. राख्यातु (sic) सुभं भवातु सुभं
7. [भ]वतु कल्याणमस्तु.

¹ The entire name is illegible, but probably was either Nārāṇa or Pañcāṇa, as the two terminal syllables *ina* can be still read distinctly.

Of no particular interest is a small *devaṭī* walled in the interior of a niche, which is found near the brim of the present *talāva*. It is in yellow Jesalmeri stone and represents a woman with a child in her arms, evidently a mother who became *satī* after her son. The date is Samvat 1717.

More interesting are two other *devaṭīs* which are found a little distance from the wells, to the north. Both are in yellow Jesalmeri stone and stand over a raised square platform. The older of the two represents a horseman with three *satīs*, and has an inscription of 11 lines, covering a space of 11" high by 8½" broad, and recording that Dhannō, a Cahuāṇa of the Vāghora *gotra*, passed from this world in the year Samvat 1654, the twelfth day of the bright fortnight of Pausa, and his three wives became *satīs* after him. The other inscription consists of 5 lines, covering a space of about 3½" high by 14½" broad, and records that Hāsā, the Jētuṅga wife of Bhoja Rāja of the Vāghora *gotra*, immolated herself on the pyre of her dead husband, the ninth day of the bright fortnight of Phālguṇa, of the year Samvat 1667.

12. NĀḌA.

About 2 miles almost due north of the wells, is the village of Nāḍa. Here the most characteristic feature of the place, physically, is formed by seven or eight *talāṭīs*, or small tanks, scattered around the village, which with the thorny shrubs and trees clustered on their banks, make a pleasant variation from the monotony of the desolate wilderness of that part of the country. One of these *talāṭīs*, which is known under the name of *Kesoḷāī*, has on its bank a *kīrtistambha* in red sand-stone bearing an inscription of 6 lines, covering a space of 6½" high by 7½" broad. The date of the inscription is not entirely legible, but there can be no doubt that the record belongs to the Samvat Century 1700. The object of the *kīrtistambha* is to record that the tank in question was caused to be made by the Parihāra Kesava—whence the name of *Kesoḷāī*, which is perpetuated to this day.

1. ॥ स्वसति श्रीगणेशकुल-
2. देशा प्राप्तादात् संवत् १[७२]-३
3. वरषे फागुण सुदि ५ रविवारे
4. अत्र दिने केसव पण्डितारस्य
5. तडाग [प्र]ति[ष्ठा] [क]ते कौरतथंभ
6. सथापि[त]: [॥] शु[भ] भवतु ॥

Of the other few recent inscriptions which are found in or around the village, there is only one which is worth noticing.

This is an inscription of 7 lines, covering a space of 8" x 11", incised on the right jamb of a gateway leading to the house of the Vāghora *jagirdar* of the place. The gateway is in red sand-stone. The inscription is surmounted by the print of a female's hand carved in the stone and records that in the year *Samvat* 1762, the ninth day of the dark fortnight of *Jetha*. Sunday, Vāghora Indra Bhāṇa went to heaven and his wife, the Sākhalī Amrita De, became *satī* after him. It will be noticed that these names are the same as those mentioned in the inscription near the second well, which is dated *Samvat* 1756 (see above).

1. ॥ श्रीगुणसाइ नम ।
2. ॥ संवत् १७६२ वर्ष मित्ती जेठ व-
3. ॥ ६ ६ दंने आदीतवार वाघोड़
4. ॥ श्रीइंद्रभाणजी देवलोक ऊ-
5. ॥ वा माहासती वज्जजी अमरतदे
6. ॥ सांघली देवगत । सुभं भवतु
7. ॥ लिखतं सिलावट —] ईचंद ॥

APPENDIX.

COMMEMORATIVE SONGS OF THE EARLY RULERS OF BIKANER.

It is no exaggeration to say that the old poetry by the bards of the Rajputs must be given a very prominent place amongst the sources of information for the mediaeval history of Rajputana. This will seem a paradox to anybody who has come into touch with the modern bards and has heard or read anything of their compositions. In fact, generally speaking, there is probably no bardic literature in any part of the world, in which truth is so masked by fiction or so disfigured by hyperboles, as in the bardic literature of Rajputana. In the magniloquent strains of a Cārāṇa, everything takes a gigantic form, as if he was seeing the world through a magnifying glass; every skirmish becomes a Mahābhārata, every little hamlet a Lāṅkā, every warrior a giant who with his arms upholds the sky. But, if one allows for these exaggerations, and reduces things to their natural size, and at the same time denudes the facts of all the fiction with which they are coated, the kernel of truth can still be seen lurking inside.

There is, of course, a distinction to be made between poems and poems. It is obvious that to have a real historical value, a poem must be genuine, i.e. must be contemporary

with the personage it is intended to celebrate, or the event it is intended to record. Posthumous poems are always more or less open to suspicion, and even when written in a sober and apparently impartial tone, they can never be expected to be so accurate as they would be if they had been written during the time with which they are concerned. Fortunately, contemporary poems are not scanty in the bardic literature of Rajputana, thanks to the warm encouragement and liberal support which the Rajput chiefs had been giving to their bards, the Cāraṇas, since the very beginning of the Old Western Rājasthānī period. Every Cāraṇa who "ate the salt" of a Rajput Chief, was naturally bound to retribute his master and patron by composing poems in his honour, and immortalizing with his rhyme the record of his master's feats of arms, courage, liberality, etc. All the noteworthy events in the life of the Chief were preserved to memory in the verses of the Cāraṇa, and the Chief had hardly sheathed his sword after an encounter with his enemies, that the Cāraṇa was ready to welcome him with a song commemorating his bravery. These songs, composed immediately after the event which they are intended to record, if seen in a true light allowing for all the usual exaggerations and the partiality of the Poet, are nothing short of real historical documents.

The particular class of bardic poems mentioned above, is generally known by the Cāraṇas under the name of *sākha rī kaviṭā*, which literally means "testimonial poetry." This is in the form of small songs, which are found abundantly interspersed in the *Khyātas* or prose chronicles, where they are quoted as a kind of proof of the facts narrated. Often, especially when referring to the earliest period in the genealogy of a Rajput family, these "testimonial," or "commemorative" songs are only later forgeries, but in such a case they are easily recognizable. If the bardic literature of Rajputana had been preserved to us in its entirety, we would nowadays possess in the *sākha rī kaviṭā* a continuous chain of evidence embracing a period going from about the thirteenth century A.D. down to the present time. Unfortunately, the greatest part of this vast literature is lost. But even the small part of it that has survived, is considerable, and when the scattered fragments are collected and put together, they will constitute a source of information of primary importance, which any inquirer into the history of the Rajputs must necessarily take into account.

The small selection of commemorative songs which I publish below, will give some idea of the nature of this peculiar kind of literary compositions, and the help which the historian can expect from them. They are all songs referring to the early history of Bikaner, from the time of rāva Vikō, the founder of Bikaner (Samvat 1545), down to the time of rājā Rāya Singha, the illustrious general who served under Akbar.

They cover, though not entirely, a period of five generations. Before producing the songs, I must, however, premise a few words in explanation of the metre in which they are composed and the language in which they are couched.

Commemorative songs, partaking, as they more or less do, of the nature of extemporaneous compositions, are necessarily short. The metres most commonly preferred by the Cāraṇas for their commemorative songs, are two: the *gīta*, and the *chappaya kavitta*. Of these, the latter is well known from the Hindī poetry and does not call for any particular attention here. But the *gīta*, being a metrical composition peculiar to Dīṅgaḷa, deserves some words of explanation. It consists of four stanzas¹ of four lines each, but as the number of the instants in each line can vary from a maximum of 23 to a minimum of 14, there are different varieties of *gītas*, which the prosodists have carefully described and designed with particular names. The most common form of *gīta* is that known under the name of *choṭō sāṇora*. In it, each stanza consists of four lines, of which the first and third numbering 16 instants, and the second and fourth 15. The first line in the first stanza, however, forms an exception in that it has 18 instants instead of 16. The second and fourth lines in each stanza rhyme together. The other varieties of *gīta*, which most frequently occur, are: the *sapaṅkharō*, the *sāvajharō*, and the *vaḍō sāṇora*. The *sapaṅkharō* is not regulated by the number of prosodic instants, but only by the number of syllables. All lines in a *gīta* must have the *veṇasagūṭi*, i.e. the first and last word in each line must begin with the same letter.

As regards art in the *gīta* form of songs, there is an interesting particular to be noted. It is this: that the four stanzas which form the *gīta*, contain all the same idea or thought, but expressed in a different form and with different words. It is generally a similitude, which is first expressed in the first stanza, and then repeated in the three other stanzas in a slightly different form.² It follows that the circle of meaning or of contents in a *gīta* is always a very narrow one. It is only one single fact or particular that a *gīta* generally records, like the capture of a stronghold, the defeating of an enemy, the glorious death of a hero in battle, the gift of a village to a bard, and so on. The subject is rarely described directly: it is generally described

¹ In particular cases, the number of the stanzas may be only 3, and in other cases it may also exceed 4, but the standard form of *gīta* has always 4 stanzas.

² The late Kavirājā Āsiyō Murāri Dāna of Jodhpur, in his famous work, the *Jasavanta Jaso Bhūsaṇa* (Jodhpur, Samvat 1954, pp. 142-5), calls attention to this particular feature of the *gīta* form of Dīṅgaḷa poetry, and comparing it with the different *rūṭis* or manners of diction of the Sanskrit rhetoricians—the *Pāncālī*, the *Gauḍī*, the *Vaidarbhī*, etc.—, suggests that it should be called the *Māravī rūṭi*.

indirectly in a figurative way. For instance, a bard who wanted to celebrate Rāya Siṅha's liberality and the great number of elephants he gave away to the Cāraṇas, pictured Indra as full of anxiety for his elephant Airāvata, lest Rāya Siṅha should take it away from him and give it to some Cāraṇa. Another bard, who composed on the same subject, represented the many elephants given away by Rāya Siṅha as throwing up with their trunks the dust of infamy over the heads of misers. A third one depicted the same elephants as a congregation of clouds pouring down rain and inundating the earth to drown the less generous chiefs. In some *gītas* the subject is described in a plain and simple way, without figures, but such *gītas*, though they may be more helpful to the historian, are considered as very poor compositions by the rhetorician. Lastly, instead of repeating the same simile or figure in all the four stanzas, the bard often prefers to form a complex similitude and develop it gradually in the four stanzas, in which case each stanza has a separate contents of its own, different from the contents of the other stanzas. To give an illustration, suppose the bard wants to commemorate a battle and has chosen for it the similitude of a rain storm. In the first stanza he will begin by describing the gathering of the clouds, in the form of the two opposite armies, and the darkening of the sun by the dust raised by the marching of the elephants, horses, and men. In the second, he will represent the roaring of the elephants and the beating of the drums as the thundering, and the flashing of the naked swords as the lightning. In the third, he will depict the discharge of arrows, bullets, and balls, as a downpour of rain and hail; and in the fourth he will probably conclude his similitude by saying that the earth, fecundated by the rain, produced the harvest of victory.

The commemorative songs given below were composed at different times during the two last decades of the fifteenth century, and the six or seven first decades of the sixteenth century A.D. Therefore, they were composed in *Old Dīṅgala*. I have explained elsewhere¹ the meaning of the term *Dīṅgala*, and have also remarked that, analogously to the division of the common vernacular into Old Western Rājasthānī and Māravārī (or Gujarātī), *Dīṅgala* may be also divided into two stages, which I have named *Old Dīṅgala* and *Later Dīṅgala*, respectively. The term of separation between the two stages, may be approximately fixed towards the close of the sixteenth century A.D. The existence of an *Old Dīṅgala* stage is ignored by the bards, who for centuries have been doing all their best to modernize the form of any Old *Dīṅgala* work which they have preserved, thereby eliminating from it all those phonetical and morphological peculiarities, which form the most striking

¹ *Journ. As. Soc. of Beng.*, Vol. X, No. 10, 1914, pp. 375-77.

difference between Old and Later Dīṅgaḷa. One of these, and certainly the most evident of all, is the hiatus in the vocalic groups *āi*, *ai*, which is preserved in Old Dīṅgaḷa, much as it is in Old Western Rājasthānī, whereas in Later Dīṅgaḷa the two groups are contracted into *ē*, *ō*. Another peculiarity of the Old Dīṅgaḷa is the preservation of the original *i* in the termination of the instrumental and locative singular, and of the conjunctive participle. It is obvious that no serious attempt at critically editing an Old Dīṅgaḷa text can be made, unless the editor first of all proposes to himself the task of restituting into their original archaic form all those words which have been modernized by the later bards and amanuenses. This is what I have tried to do in the songs given below. unmindful of the criticism which the bards of Rājputana will raise against me, for daring to violate what they regard as the traditional and correct form of their language.

The first song which is given below, is in honour of rāva Vikò, and commemorates his rescue of Pūgaḷa and Vērasalapura, two Bhāṭī forts, from the hands of the Muhammadans who had captured them. Vikò is compared to Kṛṣṇa, who lifting the mount Govardhana on one finger, sheltered the *gopīs* from the immense deluge of rain, which Indra had sent to test his divinity. In the same way, says the Poet, Vikò sheltered Pūgaḷa and Vērasalapura, but his action was much more praiseworthy than that of Kṛṣṇa, because the latter benefited his own people, whereas Vikò benefited people who were strangers to him.

So far the Poet. We now must try to integrate the information supplied by him, and find out on which occasion rāva Vikò liberated Pūgaḷa and Vērasalapura from the hands of the Muhammadans. Pūgaḷa, at the time of Vikò, was in the hands of Sekhò, a son of Vērasala Cācāvata, the Bhāṭī founder of Vērasalapura. From the *Khyāta* of Muhanòta Nēṇa Sī, we know that Sekhò had three brothers: Jaga Māla, Jogāita, and Tiloka Sī. Jaga Māla had inherited Mūmaṇa Vāhaṇa and a portion of the territory of Vērasalapura; Jogāita Kekarora and the remaining portion of Vērasalapura; and Tiloka Sī—though Nēṇa Sī does not state it—had probably inherited Maròta. Rāva Sekhò is well known from the Bikaner chronicles, and his relations with rāva Vikò form the subject of different anecdotes. The *Khyāta* of Dayāḷa Dāsa—a very recent chronicle of Bikaner, which is locally considered as the best source of information for the old history of the State—states that Sekhò, who was a great robber, when returning one day with booty from the neighbourhood of Multan, was overtaken by 400 of the Multan garrison and made a prisoner. Thereupon, continues the chronicle, Sekhò's wife went to Karanījtī—the well-known deified Cāraṇī, who is considered as the tutelary deity

of Bikaner—, and promised that her daughter should marry Vikò, if Sekhò were liberated. Karaniji granted the prayer, and flying off to Multan, brought Sekhò, who, though unwillingly, bestowed his daughter on rāva Vikò. Incorrect and absurd as the above account is, it is not the less interesting as showing the tendency prevalent in these later times, to attribute everything that happened in Bikaner since the days of rāva Vikò, and even before, to the influence of Karaniji. For this tendency, which is much detrimental to the merits of the princes who with their swords conquered the country and maintained it in their hands, it is the Cāraṇas who are the only responsible.

Much more creditable to rāva Vikò on one side, and more conformable with common reason and with the meaning of our song on the other, is a version of the same fact, contained in an anonymous poem in *Chandas* in honour of rāva Jēta Sī. An old manuscript of this poem is extant in the Darbar Library in the Fort of Bikaner, and it has been described in *Descriptive Catalogue of Bardic and Historical Manuscripts*, Section ii, part i, under No. 2 (a). Though the subject of the *Chandas* is principally formed by a description of the exploits of rāva Jēta Sī, yet the poem contains also an introductory part, in which an account is given of the predecessors of Jēta Sī from Saḷakhò down to Jēta Sī's father Lūna Karaṇa. It is here that, in the part devoted to rāva Vikò, we find the following trustworthy account of the particular event with which we are concerned. Rāva Sekhò was a thorn in the ribs of the Langahs, therefore they conjured to capture him with the help of Sekhò's own brothers Tilhò, i.e. Tiloka Sī, and Jaga Māla. Apparently, it was the two latter who made Sekhò a prisoner and delivered him into the hands of the Langahs. Captured Sekhò, Tilhò with the assistance of his Muhammadan allies marched on Pūgaḷa and took it. But their success was only a momentary one, for Vikò was not slow in gathering his army and falling upon the Langahs and their Bhātī allies. The enemy forces were dispersed, Mūmaṇa and Maroṭa were expugned, the Langahs were pursued back into their own territory, and Sekhò was liberated from their hands. Apparently Jogò, i.e. Jogāita, the third brother of Sekhò, had also a part in the coalition and was defeated with the others. It was after this victory, concludes the Poet, that Vikò went to Pūgaḷa in the garb of a bridegroom and married the daughter of Sekhò.

The name of the Poet is given as Cōhatha, a Bāratha Cāraṇa who notoriously lived under Vikò. The text of the *gita*, which follows below, is derived from a manuscript in the Darbar Library in the Fort of Bikaner. The MS. was written between Samvat 1615 and 1634, and has been described in *Descr. Cat.*, etc., Sect. ii, pt. i, under No. 15 (g).

वीकड वाखाणि जेणि वडरायँ
 मोटा गढ राखइ^१ मखलि ।
 अपखइ^२ गोकल तणँ^३ उबारियइ
 कान्ह प्रवाड़उ कियउ^४ कलि ॥ १ ॥
 काँठलिअे उग्रहिअे कमधज
 नरिँद^५ वखाणइ घणा नरिँद ।
 तइँ आँगुली अनड^६ त्र उपरि
 गड़े कियउ पड़ते गोविँद ॥ २ ॥
 उपरि गोपि कियइ गिरि ओलइ
 अज्जसइ आदिवराह उरु ।
 वीयहिआ उग्रहिआ वीकइ
 पूगल नइ वइरसल्लपुर^७ ॥ ३ ॥
 अपूरब दे वर^८ दाखि^९ अतिगह
 कोट बि राखिय ठेलि कँधार ।
 पर उपगार भला पुरुखोतम
 अपखँ^{१०} जगत करइ उपगार ॥ ४ ॥

1. Praise Vikò, for he protects [even] the big strongholds in the jurisdiction of the [other] big *rācas*. What an extraordinary feat doest thou, O Kṛṣṇa, deem thine of preserving thy own Gokala?

2. It is because the Kamandhaja¹¹ [actually] cleared away the clouds [of the enemies] that [so] many monarchs praise that monarch. [Whereas] thou [contentedst thyself with simply] keeping over thyself, on one finger, the mount [Govardhana], whilst the hail continued to fall, O Govinda.¹²

3. For having [simply] made a shelter of that mount over the *gopīs*, the heart of the Ādivarāha¹² rejoiceth [so much]. [But] Vikò [did much more, in that he] rescued the captured Pūgala and Vèrasalapura.

4. Bestowing an unprecedented boon, and displaying an

१ ०वे. To avoid overcrowding notes, I shall henceforth leave unmentioned cases in which the MSS. write *खै* for *खइ*, and *खौ* for *खउ*.

२ आ०. ३ ०णो. ४ किसी. ५ ०रीँद. ६ अ०. ७ बैरसल?

८ ०रि. ९ ०विय. १० आ०.

¹¹ An epithet of the Rāthōras.

¹² Notice how the Poet uses a different name for Kṛṣṇa, in each of the first three stanzas.

extraordinary energy, [Vikò] saved both the strongholds, repelling the Muhammadans. [It is only] the good and superior folk who benefit strangers; [whereas] the common folk benefit [only] their own.

The song that follows, is also in honour of rāva Vikò, and celebrates the resistance offered by him to a powerful coalition which was formed against him by rāva Sātala of Jodhpur, rāvaḷa Deī Dāsa of Jesalmer, rāva Sekhò of Pūgala, and the Khān of Nāgōra. This event is not even mentioned in the *Khyāta* of Dayāla Dāsa, but is described in other older works, like the *Chandas* of rāva Jēta Sī mentioned above, and the *Khyāta* of MS. 30, of *Descr. Cat. of Bar. and Hist. MSS.*, Sect. i, pt. ii. It seems that the chiefs of Jodhpur and Jesalmer, together with the Khān of Nāgōra, made a coalition against Vikò and invaded his territory. The date is not given in any of the works mentioned above, but we can safely circumscribe it between Samvat 1545—the year of the accession of rāva Sātala and of the founding of Bikaner—, and Samvat 1548,—the year of the battle of Kosānò, in which Sātala lost his life. Apparently, rāva Sekhò of Pūgala was unwilling to fight against his son-in-law, but was forced to do so by the rāvaḷa of Jesalmer, to whom Pūgala was in a state of more or less nominal subordination in those times. Whatever momentary success the four allies may have scored on rāva Vikò at first, certain it is that they were unable to reduce him, and at last were forced to withdraw with scorn, “rubbing their hands,” as the author of the *Jēta Sī rā Chanda* says.¹ It is significant that most of the Jodhpur chronicles are absolutely silent about the adventure.

In the song, the four enemies are compared to four elephants, that come into the forest of Jāgaḷū to graze. But here they find Vikò, a terrible lion, who confronts them roaring his throat. Frightened, they turn back, relishing instead of grass, the points of the arrows of their powerful foe.

The song is anonymous. The manuscripts, in which it has been preserved, are the following: A = *Descr. Cat. of Bar. and Hist. MSS.*, Sect. i, pt. ii, No. 30, p. 11a-b; B = *Ditto*, Sect. ii, pt. i, No. 21, p. 66b.

वइरायाँ लाइ विसम ² कर ³ वीकइ
हेकाँ कहेस हेकमनि ⁴ ।
ठूका आइ ⁵ सामठा डेला ⁶
वारण आरइ चरण वनि ⁷ ॥ १ ॥

¹ घरि गया चिचारइ हाथ घस्सि, *Jēt. Ch.*, 185.

² AB °संम.

³ B इल.

⁴ AB मंन°.

⁵ A °इ, B °चि.

⁶ AB डे°.

⁷ AB वन.

वीकउ हेक चियारइ वारण

थोभे सकइ नही अरि घाट ।

सारसियालाँ ¹ ऊवउ ² साँसुहउ

रोही सो करतउ रड़ड़ाट ॥ २ ॥

वइरायाँ ऊथेड़ण ³ वीकइ

हेक रचे पइ सबल हियउ ⁴ ।

आचे ⁵ सीह वणी थह ऊपरि ⁶

कुँजरे चऊँ ⁷ ओडीर कियउ ⁸ ॥ ३ ॥

सातल देदइ सिखर सारिखा ⁹

बङ्गाली बायाधबल ¹⁰ ।

केहर ¹¹ वीकउ विचइ ¹² कुँजराँ

कठठइ उबासे कमल ¹³ ॥ ४ ॥

जोरि ¹⁴ हाथि ¹⁵ नावइ जोधाउत ¹⁶

वइरी विठइ न टूजी वारि ¹⁷ ।

सुँहटी गा ¹⁸ कुगटाले ¹⁹ चाखे

चार कि ²⁰ वन हाथिया ²¹ चियारि ²² ॥ ५ ॥

1. [Over his] enemies, [who] conjuring together [had come upon him] with one mind, Vikò [like a lion] raised [his] terrible paw. [For] near had come the huge (?) bodies (?) [of] four elephants to graze in the forest [of Bikaner].

2. Single-handed was Vikò, and four were the elephants, [and yet] the enemy host could not restrain [him]. He faced the roaring elephants ²³ in the forest, rattling his throat [in anger].

3. To overthrow his foes, Vikò, the single-handed monarch, made his heart firm. And the four elephants, who had come upon the den of the lion, threw up their trunks with a roar.

¹ A सारिसी°, B सारसी°.

² A बो°, B बूबो.

³ AB उ°.

⁴ AB ही°.

⁵ A °ये, B °वे.

⁶ AB उ°.

⁷ A चु°, B चि°.

⁸ AB की°.

⁹ A सार°.

¹⁰ A बाँष°.

¹¹ B कि°.

¹² B वी°.

¹³ B °बल.

¹⁴ B °र.

¹⁵ AB °थ.

¹⁶ AB °वत.

¹⁷ AB °र.

¹⁸ B ग्या.

¹⁹ A कुटा°.

²⁰ AB क.

²¹ AB हाथी°.

²² B चार.

²³ सारसियालाँ, from सारसी, "the roaring of an elephant with the proboscis lifted in the air."

4. [Powerful enemies they were], like Sātala, Dedò,¹ Sikhara,² and the Barbarian [of Nāgōra], the mighty archman. [But] the lion Vikò in the middle of the [four] elephants, prepares himself to fight, expanding his mouth.

5. With force, the son of Jodhò cannot be reduced, and his enemies never fight [him] a second time. After relishing the arrows [of Vikò], as if it were the grass of the forest, the four elephants withdrew.

We now come to Vikò's son and successor, rāva Lūṇa Karaṇa, whose rule, according to the current tradition, extended from the year Saṃvat 1561 to Saṃvat 1583. One of his most daring enterprises was an incursion he made into the territory of Jesalmer, venturing with his horses till under the walls of that inaccessible stronghold. The following song, which is a *chappaya kavitta*, mentions the most important exploits of Lūṇa Karaṇa. The *kavitta* is by Gorò, a poet—probably a Cāraṇa—who seems to have been contemporary with both rāva Lūṇa Karaṇa and his son and successor, rāva Jēta Sī. Judging from the pessimistic remark with which the song closes, it seems that it must have been composed soon after Lūṇa Karaṇa's death, in Saṃvat 1583.

The text of the song is derived from MS. 15 (p. 72a), of *Descr. Cat. of Bar. and Hist. MSS.*, Sect. ii, pt. i, a manuscript written between Saṃvat 1615 and 1634.

महमदखाँ सउँ^३ भिड़ण^४

नयर सिन्द^५ मुरखाणइ ।

जसलमेर दुरङ्ग

मल्युउ सऊ कोई जाणइ ।

हांसी मुहम^६ हिंसार

लीय सरसा जगि^७ लोई ।

माल महीपति भरइ^८

सिफति जम्माइ^९ सऊ कोई ।

विक्रम्म वइरि गोरउ भणइ

दल साहण मेल्या घणा ।

खणकनि^{१०} राइ^{११} उदिम किया^{१२}

लिखा न मिटई विहि तणा ॥ १ ॥

1. With Muhamad Khān he fought, and turned back the cities of Sind; then he crushed the stronghold of Jesalmer, as

¹ For Deī Dāsa.

² For Sekhò.

^३ खो.

^४ खी.

^५ स.

^६ म.

^७ ग.

^८ दे.

^९ पे.

^{१०} लु.

^{११} राय.

^{१२} कौ.

everybody knows; then marching against Hāmsī and Hīmsāra, he conquered the country as far as Sarasò. [See!] monarchs are paying him tribute, and everybody is singing his praise. Sayeth Gorò: in the feud of Virama, Lūna Karana assembled a numerous army of his kinsmen, and strove to his best [But] the decrees of Fate cannot be cancelled.

The death of Lūna Karana, which we have found vaguely alluded to in the *kavitta* above, is commemorated in another song, also in the *chappaya kavitta* metre. Lūna Karana died a glorious death on the battlefield of Dhosi, where he was met by the joint forces of the Rāvaḷa of Jesalmer and the Navāb of Sind. Though abandoned by a great number of his vassals, who treacherously stood aside or cowardly fled, the son of Vikò resolved to die on the field as is the duty of every good Rajput. The song pays a particular tribute to the loyalty of Rājadhara, a brother of Lūna Karana, who preferred to die with the latter, rather than abandon him and save himself.

The song is by the same poet Gorò and is composed in Piṅgala. I have derived the text from the same MS. 15 (p. 72a-b) of *Descr. Cat. of Bar. and Hist. MSS.*, Sect. ii, pt. i.

जाइ सकइ सो^१इ^१ जाऊ

रहइ सो^१इ मेरा साथी ।

जब^२ लगु घट महि सासु

देउं ता लगइ न छाथी ।

रावणि लङ्का दीय

राम जोगइ सिर सेती ।

इहउ^३ धर्म खचीयह

अवर तउ वणज न खेती ।

धर धारातौरथ अङ्गयउं^४

भणि गोरा जगि जसु लियउ^५ ।

लूणकनि^६ राइ विक्रम तगाइ

महि मण्डलि साकउ कियउ^७ ॥ १ ॥

मिल्यउ^८ राम सउं^९ जाइ

लङ्क ऊपरि^{१०} चित दीयउ^{११} ।

^१ ई.

^२ व.

^३ हो.

^४ यो.

^५ लीयो.

^६ लु.

^७ कीयो.

^८ लो.

^९ लो.

^{१०} उ.

^{११} यो.

तब¹ राघव भोलाय²
 कछा³ तिन तिस कउ कौय⁴ ।
 जीव राखि आयाउं
 कोड़ि निसहर सङ्गाय⁵ ।
 दिय⁶ भँवर कउ भेदु
 पाकिणउ परिहँस साय⁷ ।
 भणि गोरा जोध नरिन्द कुलि
 परदल दीठाँ⁸ नऊ डरउं⁹ ।
 राजघर कहइ वीकम¹⁰ तगाउ
 हउं¹¹ न बभौखण¹² न्यउं¹³ करउं ॥ २ ॥
 कनि कियउ¹⁴ तउं¹⁵ करउं
 कियउ¹⁶ ज्यउं¹⁷ राउति¹⁸ जाजइ ।
 रिण दीठाँ वन¹⁹ तकउं
 जोध राउ रिणमल²⁰ जाजइ ।
 अमर न को संसारि
 साथि तउ किक्कू न जाई ।
 दानु खणु²¹ सत सील
 अन्ति ओ होहि सखाई ।
 कमधज²² कुलइ²³ हि निकलइ नर
 भस्मि²⁴ गोरउ²⁵ सचा कछा ।
 राजघरि राइ सँग्राम कौय
 सबदु²⁶ अकु जुगि जुगि रह्या ॥ ३ ॥

1. "He who can [bear the ignominy of] withdrawing, let him withdraw; he who will remain, let him be my companion. So long as I have breath in my human frame, I will not surrender my elephant. Rāvaṇa gave Lankā to Rāma, [but he gave it] together with [his own] heads²⁷ [For] the duty of the Rajput is this, nor [is there for him] anything [like] commerce or agri-

1 °व.	2 °यो.	3 °ह्यो.	4 °यो.	5 °रौ.	6 °यो.
7 °रौ.	8 °ठां.	9 °रौ.	10 वि°.	11 ह्यो.	12 भभौ°.
13 ह्यो.	14 कौयो.	15 त्यो.	16 कौ°.	17 ह्यो.	18 राव°.
19 वण.	20 र°.	21 वगु.	22 °ज्ज.	23 °ले.	24 °णि.
25 °रइ.	26 सब°.				

²⁷ As is well known, Rāvaṇa had ten heads.

culture." [With this determination]—sayeth Gorò—rāva Lūṇa Karaṇa, the son of Vikrama,¹ resorted on this earth to the sanctuary of the sword, and acquired renown in the world, and fought a [memorable] battle over the orb of the earth.

2. "[Cursed be Vibhīṣaṇa! For he] went to join Rāma, and set [his covetous] mind on Laṅkā, and then, coaxed by the Rāghava,² did whatever he told [him to do], and saving his own life, [helped to] destroy millions of *rākṣasas*, [till at last] he betrayed the secret of the bee [in which the stamina of the life of Rāvaṇa lay concealed], and completed the ultimate defeat [of his brother]."—Sayeth Gorò: in the family of the monarch Jodhò, Rājadhara, the son of Vikrama, says: "At the sight of the enemy army, I do not fear. I will never do like Vibhīṣaṇa."

3. "I will behave as Karna³ behaved, or as rāvata Jājò⁴ behaved. If at seeing the [impending] battle, I seek [safety] in the *jungle*, then rāva Jodhò and Rīṇa Mala⁵ will be ashamed [of me]. Nobody is immortal in this world, and nothing goes with [him, who departs from this life, but] the liberality, the valour, the truthfulness, and the good behaviour, these are the companions at the end [of one's life]." In the Kamandhaja family,—sayeth Gorò—all men are veritably called irreprehensible. [In this spirit], rāva Rājadhara fought the battle, and an unanimous voice [of praise] remained [after him, to last through] all the ages.

Rāva Lūṇa Karaṇa was succeeded by his son Jēta Sī, who held in his hands the reins of Bikaner from Samvat 1583 to 1598. Fortunate like his father in life, he was similarly unfortunate in death, for he also fell in battle, in a vain attempt to oppose the invading forces of Māla De, his ambitious and unscrupulous neighbour of Jodhpur. Nothing can be more conspicuous than Māla De's ingratitude, when one knows that it was Jēta Sī's help that enabled Māla De's father, Gāgò, to defeat his rival Sekhò, who strongly supported by the Khān of Nāgōra, contested him the succession to the "gadi" of Jodhpur. From both the Bikaner and the Jodhpur chronicles, it appears that Jēta Sī had a very prominent part in the defeat of Sekhò and his Muhammadan ally. The *kavitta* which I give below, commemorates an encounter between Jēta Sī and a Muhammadan army, which took place at Jākhāniyò—a village on the Bikaner and Nāgōra border—the 13th day of the dark

¹ Vikò.

² Rāma.

³ The famous hero of the Mahābhārata.

⁴ A valiant Rajput chief, who on one occasion when the village where he was temporarily staying as a guest, was assailed by a strong enemy force, though he would have been justified in leaving the place and saving himself, preferred to remain and die sword in hand.

⁵ Name of the father of rāva Jodhò.

fortnight of Kāti, of the year Samvat 1585. I am uncertain as to whether the song is to be understood as referring to the battle in which rāva Jēta Si, fighting on the side of Gāgò, defeated the Khān of Nāgòra. The date given by the Jodhpur chronicles for the last-mentioned battle is Samvat 1586 (the *Mūdhī-yāra rī Khyāta*, however, has Samvat 1585), the 1st day of the bright fortnight of Migasara, and, moreover, the name of the place where the battle was fought is not Jākhāniyò, but Sevaki. Possibly, Jēta Si and Gāgò did not fight jointly, as the chronicles seem to imply, but separately. The *Jēta Si rò Chanda* does not mention the place where the battle took place (see stanzas 247-8).

The *kavitta* is anonymous, and is derived from MS. 21 (p. 88b), of *Descr. Cat. of Bar. and Hist. MSS.*, Sect. ii, pt. i.

पनरह असियइ¹ पाँच
 सँवत तिथ तेरस सणियइ² ।
 कन्नउजाँ³ काबली
 कलह वदि काती वणियइ² ।
 इल⁴ अपहरा [उतरी*]
 भला नर सूरु भणियइ² ।
 मारि⁵ मौर मारुअ⁶
 धरा इम लीघी धणिय² ।
 जुडन्तइ खेति⁷ जाखाणियइ³
 अणिय² खान उथणियउ⁹ ।
 जइतसी जुड¹⁰ जाहण हरइ¹¹
 सुगलाँ सेती मणियउ¹² ॥ १ ॥

1. In the Samvat year fifteen hundred and twenty-five, the thirteenth day of the dark fortnight of Kārttika, on Saturday, a battle took place between the Kanaujās¹³ and the Kābulis,¹⁴ [where] the heavenly nymphs [were seen to] alight* on the earth for the sake of the distinguished heroes. Thus the Mārūās,¹⁵ the sovereigns, freed the earth, smiting the Muhammadans. Engaging battle on the field of Jākhāniyò, [they] overturned the Khān [of Nāgòra] with the points of [their] spears. [In this way] Jēta Si, the nephew of Jālhaṇa, waged a war against the Mugals.¹⁴

1 °सीये.

2 °षीये.

3 नौजा.

4 °लि.

5 °र.

6 °रवे.

7 °त.

8 °षीयो.

9 °षीयैयो.

10 °ध.

11 °ही.

12 °हीयो.

13 An epithet of the Rāthòras.

14 Generical, for "Muhammadans."

15 The same as *Marwaris*.

But the most illustrious of all Jêta Si's achievements was the victory he obtained over the army of Kamran, the son of Babar, who after taking Bhatanêra had marched over Bikaner. The victory was achieved by means of a nocturnal assault, in which the forces of Kamran were surprised unprepared, and completely routed. This happened in the year Samvat 1591, and the event is commemorated not only in several minor extemporaneous songs, but also in two big poems in *chandas*, whereof one has already been mentioned above.

The song given below is one of those which commemorate the afore-mentioned victory. It consists of three *chappaya kavittas*, each of which contains an independent simile of its own. In the first, Jêta Si is represented as a goldsmith, who melts in the crucible, and beats, and weighs, and cuts the gold of the army of Kamran. In the second, Jêta Si is described as making the enemy army dance like an acrobat. In the third, he is represented as a sacrificing brahmin, who makes a sacrifice of the enemy army in the fire. The song is in Pîngaḷa. The name of its author is Sivò, probably a Cârana.

The text is derived from the same MS. 15 (p. 19a) of *Descr. Cat. of Bar. and Hist. MSS.*, Sect. ii, pt. i.

कट्टारी^१ साँडसी

भारि सङ्गोरि लियउ इम ।

अधिक तेजि फूँकयउ

गारि करि^२ गोठ कियउ तिम ।

घन आवधि कुट्टयउ^३

वङ्ग यङ्गोरवि मिल्हउ^४ ।

करिवरि^५ करि कल्लयउ^६

रती मासे^७ धरि तुल्लउ^८ ।

भनि सिवा राइ लूणकन सुवि

सेल जन्ति कल्लयउ^९ धरि ।

जइतसी राइ कम्मरा दल

घड़उ भञ्जि सुन्नार^{१०} धरि ॥ १ ॥

पइ घुग्घर^{११} गजघयट

राग घुग्घर^{११} मिसि सज्जिग^{१२} ।

^१ कटा°.

^२ °हि.

^३ कुट°.

^४ °ल्लउ.

^५ °र.

^६ °कयो.

^७ °से.

^८ तुल°.

^९ °दयो.

^{१०} सुना°.

^{११} घुघ°.

^{१२} सजि°.

बगतर चोला मिसिहि
 पड़ह नीसायति वज्जिग ।
 फल मिसिहि सिरि टोप
 ताल तरवारिनि तोड़उ ।
 कलह मिसिहि कच्छयउ ¹
 घाह अरियण चड़ मोड़उ ।
 लूणकन राह नन्दण अटल
 सुकवि सिवा सच्चू ² चवउ ³ ।
 जइतसौ ⁴ राह कम्मरा दल
 नटारम्भि नच्चावयउ ⁵ ॥ २ ॥

चिविध ⁶ सेन करि कुण्ड
 रुहिरि त्रिति ⁷ ठलह घाह घण ।
 अस्सू ⁸ नर गज्ज ⁹ आट
 कियउ स[ङ्कल्प*] ¹⁰ ततक्खिय ¹¹ ।
 खेह धूवउ परीख
 [*ख]ग ¹² भालाहल फट्टिग ¹³ ।
 अरि सिरि करि नालेर
 ग्रिद्ध फल मख्खि ¹⁴ थट्टिग ¹⁵ ।
 रिन जग रचउ लूणकन ¹⁶ सुवि ¹⁷
 सुकवि सिवा अक्खर ¹⁸ करइ ¹⁹ ।
 जइतसौ राह होमइ ²⁰ प्रिसण
 सिर ²¹ बिभूति सङ्कर धरइ ²² ॥ ३ ॥

1. Grasping and bending [it] with the pinchers of the dagger, [he] took [it], then he blew with great force [into the furnace] and melted [it], and made a lump [of it], then he beat [it] with the mallet of the arms, and having made [it] straight from crooked [that it was], he polished [it], then with the sword he cut [it] into pieces, and [afterwards] he weighed it

- | | | | | |
|--------------|-------------|----------|----------|----------------|
| 1 कइ°. | 2 °चु. | 3 चउ. | 4 जैती. | 5 नचा°. |
| 6 °धि. | 7 °त. | 8 °कु. | 9 °ज. | 10 संकि (sic). |
| 11 °षण. | 12 ग (sic). | 13 °टिग. | 14 °प. | 15 °टिग. |
| 16 °न. | 17 °व. | 18 अष°. | 19 °धरै. | 20 °मे. |
| 21 सा (sic). | 22 करै. | | | |

against the weights of gold,¹ Sayeth Sivò : the son of Lūṇa Karaṇa [lastly] passed [it, under the form of] spears, through the *jantrī*² [of the enemy bodies]. [In this way] rāva Jēta Sī broke and wrought the army of Kamarò, as the goldsmith does with the gold.

2. Jingling horse-bells and elephant-bells were adapted to the feet [to produce] as it were the music of anklet bells, coats of arms [were put on] in the place of bodice, warlike trumpets were sounded [in the place of ordinary] drums, helmets were put on on the head in the place of flowers, the time was beaten with the swords, the loins were girdled up for a strife, and the body of the enemy was curved with blows. [In this way] the invincible son of rāva Lūṇa Karaṇa—[sayeth] the poet Sivò : I am telling the truth—, rāva Jēta Sī made the army of Kamarò³ dance [like an actor] in an acrobatic performance.

3. Arranging [his] threefold army like the *kunda*, as it were, whilst the blood was streaming from the many wounds like the ghee, and [pouring in] the horses, the men, and the elephants like the flour, as it were, [he] instantly formed the determination [to accomplish the sacrifice]. The [cloud of] dust appeared like the [column of] smoke, and the [flashing] swords split up like the flames. [Then], taking the heads of the enemies as the cocoanuts, whilst the vultures [for the sake of the] flesh, were assembling [like as many brahmins] in the sacrificial ground, the son of Lūṇa Karaṇa performed the sacrifice of the battle. Sayeth the poet Sivò : [in this way] rāva Jēta Sī maketh a sacrifice [of his] enemies [in the fire], and Śaṅkara putteth on the skulls—the ashes, as it were, [remaining from the fire of the sacrifice].⁴

The task of revenging Jēta Sī's death over Māla De, the powerful and unscrupulous aggressor from Jodhpur, and freeing Bikaner from his usurpation, fell to Jēta Sī's son and successor, Kalyāṇa Māla. He repaired to Sarasò and from there began to ravage the portion of the Bikaner territory which had been occupied by Māla De, meanwhile looking for an opportunity that would give him the means to accomplish his designs. The opportunity soon presented itself when Virāma De Dūdā-vata, dispossessed of his domains of Meratò by the same Māla De, went to the court of Śer Śāh to offer his services and obtain revenge in return. Kalyāṇa Māla, accompanied by his brother

¹ i.e. *ratīs* and *māsūs*.

² A brass plate with holes of different sizes, through which the goldsmith passes the gold to make it into a tiny wire.

³ Kamran.

⁴ Translations like the above, literally moulded on the original, become necessarily awkward and even unintelligible, when one has to deal with words which in the original are susceptible of being used in a double meaning, and for which European languages have no equivalents. Unnecessary to say, all the beauty of the original is lost in such translations.

Bhīva Rāja, was not slow in joining Virama De at the imperial court, and according to the chronicles, had a principal part in inducing Śer Śāh to undertake against Marwar that expedition which ended in the complete rout of Māla De and the subjugation of Jodhpur. The date given by the Jodhpur chronicles for the last-mentioned event is Samvat 1600.

The *gita* given below is a pæan of triumph and exultation for the punishment thus inflicted by the imperial forces on the arrogant Māla De, and the crushing of Jodhpur. The imperial army is likened to an immense rock, and the credit of bringing it over Jodhpur is all attributed to rāva Kalyāna Māla.

The song must have enjoyed a certain popularity in previous times, for I have found it contained in no less than four manuscripts. These are : A = *Descr. Cat.*, ii, i, MS. 8, p. 11a ; B = *Descr. Cat.*, i, ii, MS. 30, pp. 161a-b ; C = *Descr. Cat.*, ii, i, MS. 21, p. 120a ; D = *Descr. Cat.*, ii, i, MS. 11, p. 46b. The name of the author is given as Cāraṇa Hamīra in MS. A, but in Ms. C the song is attributed to [Viṭhū ?] Sūjō Na[ga]rājōta.

पड़े तेखि¹ पड़हाट² भूपाल अनि³ हइकंपे⁴

जइतसुत वात संसारि जाखी ।

अकल पतिसाह मखोवराँ⁵ ऊपरइ

अणिमिखी⁶ गिजा कलियाखी⁷ आखी ॥ १ ॥

आमरद वागिया अकटा आहटइ⁸

अकटाँ काडिया⁹ पाँख आथाय ।

हियइ¹⁰ राँउ माल रइ ऊपरइ हूबकी

सबल सङ्घा¹¹ पखी¹² सिला सुरताय ॥ २ ॥¹³

घरखि गउ¹⁴ माल गह काडि पहिलइ धकइ¹⁵

फेरि सङ्घार प्रियमाद¹⁶ फेडी ।

¹ AD °ण.

² B पडियाय, C पड़टाव, D पिड़हाय.

³ ईन, D अन.

⁴ C हेकंप पड़े (for अनि हइ°).

⁵ A °रै.

⁶ BD अण°.

⁷ B °ण.

⁸ B आवरत अक रिण वाजीया अकटा, C अमरद अकणी वाजीया अहवा,
D आरमद वाजिया अकणी अकटा.

⁹ B हो°.

¹⁰ AB हो°.

¹¹ A संघा, B सिंघा.

¹² D पवे.

¹³ BCD place stanza 2 in the place of stanza 3, and vice versa.

¹⁴ C ग्यो.

¹⁵ A reads this line as follows : मेलि दल सबल कल्याण

आपड़मल.

¹⁶ A प्रियमाद संघार.

ताणियड सूर जे ¹ वइर ² राउ जइत रइ ³
गाँजिवा जोधपुर चाठि ⁴ गेड़ी ॥ ३ ॥

गाहिया प्रिसणहर ⁵ वइर ऊयाहिया
माल गमियड छिले ⁶ करनहर ⁷ मउड़ ।
वडउ राउ वालियड ओपियड ⁸ वीकपुर ⁹
रइण रखपाल कल्याण ¹⁰ राठउड़ ॥ ४ ॥

1. When, at the reverberation [of the crash] the other monarchs trembled in their hearts, [only then] the world knew the deed of the son of Jēta [Si]. [For] Kalyāna had brought over the Mandovarās ¹¹ the great ¹² Emperor, like an immensurate rock [to crush them].

2. [On the one side] the Muhammadan warriors (?) charged together in the battle, [and on the other, the men of Māla De] abandoned together their manly strength and their homes. Like a powerful imponderable stone, the Sultan fell with a thud over the breast of rāva Māla [De].

3. At the very first knock, Māla [De] fled abandoning [his] domains and [his] warlike spirit, and the earth was cleared by the destruction passed [over it ¹³ by] Sūra, [the Emperor,] whom [Kalyāna Mala] had brought—for the revenge of rāva Jētā [Si]—like a huge (?) stone, [as it were], to crush Jodhpur.

4. Crushed were the enemies, and avenged was the feud, and Mala [De] was ruined, whilst the grandson of [Lūna] Karaṇa, the ornament [of the Rāthōras], overflowed [with joy]. The great Rāva was repelled, and the city of Vikō triumphed, and the earth [became safe under its] protector, Kalyāna Rāthōra.

The following song, which is likewise in the form of a *gīta*, commemorates an expedition, which Kalyāna Mala must have undertaken against the Bhātis at some period during his reign. No mention of this expedition is found in the prose chronicles, but the silence is not surprising when one knows that the

¹ D जिण, A सूर जिणि बाणीयो (for ताणियड सूर जे). ² D वार.

³ C reads this line as follows: तात रे वेर मे सूर जाय ताणीयो.

⁴ A °उ, B °टि, D °ठ. ⁵ A वैरहर.

⁶ C °दे ओड़डे (for गमियड छिले), A गी ओड़डे (ditto).

⁷ A जेतमुति.

⁸ CD बाणीयो वालीयो.

⁹ A reads the line as follows: राउ बाणीयो सबल वालीयो बीकपुर.

¹⁰ A °णि.

¹¹ The Rāthōras of Jodhpur.

¹² Literally: inconceivable.

¹³ Cfr: खागे जोध खगेस । सीधल हर फेरे सङ्गर ।,

Amara Singhajī rā dūhā, Bārātha Narahara Dāsa rā kayiyā, 235.

Bikaner chronicles are very deficient in particulars with regard to the reign of Kalyāṇa Mālā. Probably the reason of this deficiency is that the last-mentioned *rāva* had no opportunities for distinguishing himself in any military exploit of some importance, and the events that happened under his reign were all of an ordinary kind. But silent though the chronicler may be in such cases, the bard is always wakeful, and looking, as he does, to things through his magnifying glasses, he does not discriminate between ordinary and extraordinary events. To him all that tends to add to the merits and fame of his sovereign, is equally important, and if the particular deed is but a small one in itself, he has the power to magnify it a hundred times. The expedition recorded in our song was probably of only a secondary importance, perhaps a small punitive expedition against some Bhātī raiders, but was successful, and this permitted the Poet to exaggerate it poetically and represent the Bhātīs as utterly defeated and unable ever to recover from the blow. Apparently, the expedition must have been chiefly directed against Vikūṇṇa, which was possibly captured, and its defenders put to flight.

The *gīta* is found in MS. 21 (p. 40b) of *Descr. Cat. of Bar. and Hist. MSS.*, Sect. ii, pt. i, and is attributed to Mahārū Cāgò

खरहण्ड भेलि¹ सगह² खेड़ेचा

अभंग असङ्गित अमलीमाण ।

भव लमि³ नही विसारइ भाटौ

करग जु तइ लाया किलियाण⁴ ॥ १ ॥

वे पख सुद्ध⁵ बिरदपति बिजड़इ⁶

चडि चापड़इ जु दीन्ही चोट ।

खीयाँ⁷ हेठि⁸ किया⁹ खाँडा बलि

केल्हण अनइ विक्कूँपुर¹⁰ कोट ॥ २ ॥

भेलि¹¹ दल सबल कला मारहथ¹²

सुजड़ाँ पाँणि¹³ वडा सत्र साजि¹⁴ ।

वसता रहिया¹⁵ नही विक्कूँपुर¹⁶

भाटौ सिन्ध¹⁷ लगइ गा भाजि¹⁸ ॥ ३ ॥

1. Now that thou hast assembled [against them thy] proud, invincible, undaunted, and obstinate army, O Kherēcò,¹⁹ the

1 ल.

2 सग.

3 ग.

4 कल.

5 ख.

6 डे.

7 बि.

8 ड.

9 की.

10 कुंपर.

11 मिले.

12 चया.

13 ण.

14 भा.

15 रदा.

16 कुंपर.

17 सींध.

18 ज.

19 An epithet of the Rāthōras.

Bhātīs, as long as they live, will never forget the [blows of the] hands which thou hast brought [upon them], O Kalyāṇa.

2. With the blow, which thou—O lord of encomiatory epithets, pure both from the paternal and the maternal side—marching to battle, administeredst [to them], thou struckest down the Khīyās¹ [of Vērasalapura], and [also] the Kelhaṇas¹ and [their] stronghold of Vikūṇḍapura, with the force of [thy] sword.

3. Now that thou hast assembled [against them thy] powerful army, O [enemy-] slayer Kalò,² and hast punished [thy] great enemies with the force of [thy] sword, the Bhātīs no longer inhabit Vikūṇḍapura, [but] have fled for their lives as far as the Sindh.

The reign of rājā Rāya Śiṅha, the successor of Kalyāṇa Mala, coincides with the period of the highest ebb in the history of Bikaner. His distinguished services in the fields of Gujarāt, Sirohī, and the Dekhan, had endeared him to Akbar, and in a few years his domains had been considerably increased, so as to include, at one time, even Jodhpur, the rival neighbour of the south. The rich booty made in the imperial campaigns, and the prosperity consequent upon the increased power and the efficiency of the internal administration, had turned into the sands of Bikaner a flood of wealth, which had never been known before. Simultaneously with the augmented prosperity, there had grown a taste and a liking for poetry and literary culture, of which Rāya Śiṅha himself was a most fervent patronizer. Scores of poets flocked to his court, and his praises were sung night and day, whilst his unparalleled generosity was at the same time a good theme for poetical composition and a most effective stimulus for the poets themselves. The songs in honour of Rāya Śiṅha are numbered by hundreds, and no other Ruler of Bikaner ever had so many panegyrists as Rāya Śiṅha had. Selecting a few songs from such a rich harvest is indeed embarrassing, but I will leave aside all songs referring to military exploits, and confine myself to two which celebrate two of the most characteristic features of the reign of Rāya Śiṅha: the prosperity inaugurated by him and his generosity to the bards.

The first of the two songs is anonymous. It is contained in the three MSS. following:—A = *Descr. Cat. of Bard. and Hist. MSS.*, Sect. ii, pt. i, MS. 6, p. 71a; B = *Ditto*, MS. 21, p. 100a; C = MS. P. 8 (see "Progress Report" etc., for 1915, p. 65), p. 39b.

पाताल तटइ^३ बलि^४ रह्य^५न पाऊं^६
रिध महि खगि करय^७ रहइ ।

¹ A *khāpa* or branch of the Bhātīs.

² An abbreviated form of Kalyāṇa.

³ C जडे.

⁴ AC °ल.

⁵ A °न.

⁶ BC °वू.

⁷ AC °न, A करन सरग (for खग क°).

मो मितलोकि¹ राइसिङ्ग² मारइ
कठइ रङ्ग हरि दलिङ्ग³ कहइ ॥ १ ॥

वीरोचंद⁴ सुत अहिपुरि⁵ वारइ
रविसुत⁶ तण्ड अमरपुरि⁷ राज ।
निध⁸ दातार कलाउत⁹ नरपुरि¹⁰
अनंत रोर गति¹¹ केही आज ॥ २ ॥

रयणदियण¹² पातालि¹³ न राखइ
कनकत्रवण¹⁴ रुधउ कविलास¹⁵ ।
महिपुडि¹⁶ गजदातार ज¹⁷ मारइ
विसन किसइ पुडि¹⁸ माँडू वास ॥ ३ ॥

नाग अमर नर भुवण¹⁹ निरखताँ²⁰
हेक²¹ ठउड कइ कहइ²² हरि ।
घर अरि नान्दा सिङ्ग²³ घातिया
कुरिंद²⁴ तठइ जाइ²⁵ वास करि ॥ ४ ॥ २६ ॥

1. "In the Pātala there is Bali,²⁷ and [so] I cannot stay [there], and in the Heaven there is Karna²⁷ sowing prosperity. [Now] in the mortal world there is Rāya Singha, who [has taken to] beat me. Where can I stay, O Hari?"—sayeth Poverty.

2. "In the City of the Serpents there is the son of Virocana²⁸ who keeps me off; and in the City of the Immortals

¹ A मातलोक, C मृतलोक, B °क.

² BC राय°, A रायसिङ्ग.

³ C दल°, B दरिद.

⁴ AB °चंद, C °चन.

⁵ A °पुड, BC °पुर.

⁶ C रिव°.

⁷ ABC °र.

⁸ A निधि, C निज.

⁹ ABC °वत.

¹⁰ BC °न.

¹¹ A °दयण, B रेणव्रवण, C रेणवरीस.

¹² A °ल, BC पयाल.

¹³ A किनकक्रिवन.

¹⁴ A किव°, B कव°, C कय°.

¹⁵ AB °ङ्ग, C सहिपत.

¹⁶ B °नार स, C कोडवरीसण.

¹⁷ ABC °ङ्ग.

¹⁸ A °नु.

¹⁹ B reads the line as follows: नाम सुरां मानव निरपतां, C substitutes the following: सुखल सरम प्रथमाद सीकतां.

²⁰ B चैक.

²¹ C कच्चौ.

²² C सौस.

²³ C °रंद.

²⁴ C जडे.

²⁵ AB जाय, C जा.

²⁶ AC °र.

²⁷ Both the demon Bali and the king Karna are well known in Indian mythology. In the bardic literature, they are celebrated as donors *par excellence*, the former for having surrendered his domains of the heaven and earth to Viṣṇu, and the latter for his large donations of gold to the brahmins.

²⁸ Bali.

there is the rule of the son of the Sun.¹ [Now] in the City of the Men [there has been born] the son of Kalò,² a donor of wealth. O Ananta! what shall be the sort of Poverty, to-day?"

3. "The donor of earth³ would not keep me in the Pātāla, and the donor of gold⁴ has closed [before me the doors of] the Kailāsa. [Now] on the face of the earth the donor of elephants⁵ [has also taken to] beat me. O Viṣṇu! in which of the three worlds shall I [now] make my abode?"

4. After inspecting the [three] worlds of the Serpents, the Immortals, and the Men, Hari sayeth:—" [For thee] there is [still] one place [left]. [There are] the houses of the enemies brought down by [Rāya] Śiṅha. Go, Poverty, and make [thy] abode there."

The other song of Rāya Śiṅha, with which I am going to close this small selection of commemorative songs of the early rulers of Bikaner, celebrates, as has been already anticipated above, Rāya Śiṅha's unparalleled liberality to the bards. In those golden times of Rajput life, when swords were never allowed to rust nor steeds to rest, and the bard was always wanted at the side of the warrior as a witness of his deeds and a singer of his praises, the lavishness of the Chiefs to the bards had known no limits. *Lākha-pasāvas*, or gifts equivalent to a *lākha* of rupees, had become quite an ordinary thing, and *kroṛa-pasāvas*, or gifts equivalent to a crore, were not unheard of. But a *saṁkroṛa-pasāva*, or a gift of 1½ crore of rupees, and these in cash,⁶ was given only by Rāya Śiṅha, who thus established a record of liberality which, so far as we know, has never been surpassed since. The particulars of the fact are related by Dayāla Dāsa in the following manner. Saṅkara, a Bārāṭha Cāraṇa, had pleased Rāya Śiṅha with his verses, and Rāya Śiṅha ordered his minister Karma Canda to pay to the bard one crore of rupees from his royal treasury. The minister had the 10 thousand bags counted, but before giving them to the Cāraṇa, insisted that Rāya Śiṅha himself should inspect them, hoping that at the sight of such an enormous amount of money, the Rājā might repent of his lavishness and reduce the amount. Rāya Śiṅha saw through his minister's mind, and inspected the bags, and then said: "Is this one crore? Why, I thought one crore was something more!", and ordered that the bard should be given one crore and a quarter.

The song commemorates the above-mentioned act of prodigality, and was probably composed soon afterwards. To understand the meaning of the song one must know that the

¹ Karna.

² Rāya Śiṅha, son of Kalò, an abbreviation of Kalyāṇa Mala.

³ Bali.

⁴ Karna.

⁵ Rāya Śiṅha.

⁶ It is well known that *lākha-pasāvas*, and much less *kroṛa-pasāvas*, were never paid in cash entirely but only for a small part in cash and the

bards always used to compare the liberality of their patrons to an ocean, whereof each wave is a gift. Of course, the cunning idea underlying in the comparison is that as the waves of the ocean are numberless, so should be numberless the gifts of a really liberal Chief. The above comparison is made the subject of our song, but it is further developed in that the *kroṇa-pasāva*, which formerly represented the utmost a Chief could be expected to give, is described as the boundary of the ocean, i.e. the shore, which Rāya Siṅha has overrun, with the result that the earth has been inundated and the other princes have been drowned in the flood.

The two manuscripts from which I have derived the text of the song are:—A = *Descr. Cat. of Bard. and Hist. MSS.*, Sect. ii, pt. i, MS. 6, p. 65b, and B = *Ditto*, Sect. i, pt. ii, MS. 1, p. 216b. In the latter manuscript, the song is attributed to Adhō Durasō.

सबदी लगि¹ कोड़ि मज्जाद² राइसिङ्ग³
गहवँत रइणाइर वडगात ।

ऊपरि⁴ लहरि⁵ सवाइ⁶ आपतइ
किलतइ छेतरिया⁷ इन⁸ छात ॥ १ ॥

कौध जु तइ⁹ तइ दीघ कलाउत¹⁰
अवेड¹¹ मउज लहरि¹² अनबन्ध¹³ ।

जस उरि धका¹⁴ खावता¹⁵ जाता¹⁶
बूडइ¹⁷ अनेरा सुगटबन्ध ॥ २ ॥

सउ¹⁸ लाखाँ ऊपरि¹⁹ नवसहसा
लाख पचीस ज²⁰ दीघ हिलोलि²¹ ।

खित²² पुड़ि²³ घया घडूयल²⁴ खाता²⁵
बीजा²⁶ छात बूडइ²⁷ जलबोलि²⁸ ॥ ३ ॥

rest in kind. A *lākha-pasāva*, amongst other things, included a village, and an elephant, and the total value was computed as equalling one *lākha*, but in fact it never equalled this sum.

- | | | | | |
|-----------------------|-------------------|-----------------------|------------|--------------|
| 1 AB °ग. | 2 B °ह. | 3 AB राय°. | 4 B °र. | 5 B °ई. |
| 6 B °ह. | 7 B अन. | 8 B जिकौ (for जुनई°). | 9 AB °वत. | |
| 10 B अही. | 11 B °र. | 12 B °मंघ. | 13 B °कै. | 14 B आवतां°. |
| 15 B °नां. | 16 A बुटै, B बूड. | 17 AB सव. | 18 B °र. | |
| 19 B पचीस (for प° ज). | 20 AB °ल. | 21 A °ति. | 22 B °ङ. | |
| 23 AB गङ्गो°. | 24 B पावै. | 25 B बूडै. | 26 B बीया. | |
| 27 A °ल, B जस बोल. | | | | |

पइ ऊलटउ¹ समंद² वीकपुरा

कात³ बिया वहि गा⁴ गह कृण्ड ।

मेघाडम्बर⁵ सुगट⁶ मण्डिचे⁷

मउज⁸ धकइ न सकइ पग मण्डि⁹ ॥ ३ ॥

1. One crore [was] the boundary [within which] the firm and huge ocean [of thy liberality] to the bards [used to be restrained], O Rāya Singha : [but this time] by turning up a wave [of generosity] by one-fourth bigger [than usual, and] running over [the boundary], thou hast surprised [all] the other kings.

2. What thou promisedst, thou hast given, O son of Kalò⁽¹⁰⁾, and so immense [has been] the wave of thy liberality, that, pushed away [by the force of the flood], the other crowned [monarchs] are drowning [in it].

3. Those twenty-five *lakhs* which thou, swelling up, hast given in addition to the hundred *lakhs*, O Navasahasò⁽¹¹⁾!, [have spread] over the face of the earth [so that], tumbling over and over, the other kings are drowning in the flood.

4. Over has run the water of the ocean [of thy liberality], O Vikapurò⁽¹²⁾, and the other kings have been swept away leaving their pride. [Though many a king may] set up a royal umbrella and [wear] a crown, [yet] in front of thy prodigality nobody can set his foot.

L. P. TESSITORI.

Bikaner, 25th February 1917.

¹ B °ओ. ² B स°. ³ A °च. ⁴ B ग्या. ⁵ B °डम्बर.
⁶ B सुकुट. ⁷ B सिर मंडे. ⁸ B रौक. ⁹ B मंड.

¹⁰ An abbreviated form of Kalyāṇa Mala.

¹¹ An epithet of the Rāthòṛas.

¹² An equivalent of "Bikaneri."

15. Note on a Malformation of the Common Pine-apple
(*Ananas sativus*, *Schult.*).

By P. F. FYSON.

[With Plate IX.]

The Pine-apple as is well known consists of an aggregate of numerous spirally placed flowers, the perianths of which are contiguous and form the edible part of the fruit.

In the specimen shown on the screen it will be seen that the whole inflorescence is broadened out considerably and has assumed an appearance which recalls on a gigantic scale a variety of the *Celosia cristata* *L.* of horticulture. There is also a general phyllody of the floral parts, so that while in places the separate flowers can be distinguished, along the central ridge this is not possible.

This monstrosity was brought to me by Mr. Ll. Jones of Madras, who has for many years grown choice varieties of the fruit in his garden. He had, he told me, several plants spoilt in this way, this year, but had destroyed the others. The specimen had been cut off above the leaves, so that there was no chance of keeping it alive, and with the idea of following the development of any possible parasitic organism, it was allowed to dry, and not preserved in fluid.

Sections were made from the axis of the inflorescence, and examined for fungi, but no hyphae were found. In certain parts, however, the tissue was seen to contain bodies which appeared to be of a plasmodial nature. They possess no cell wall, and as will be seen from micro-photograph shown on the screen, vary considerably in shape and size. Some are confined to one cell only, and have one nucleus, others spread through two or even more cells, and have several nuclei. The tissue so attacked is the general ground parenchyma, a few cell-layers below the epidermis; and as the plant dried and the tissues shrank the parts most affected, and especially the phyllodineous floral parts, became black. No spores or resting cells were seen.

The cause of the malformation appears therefore to have been an intracellular plasmodium, which had entered the plant probably through the roots.

Malformations of different kinds have long been studied, and a considerable literature has grown up about them. But the earlier study was directed mainly to the evidences afforded by them of the morphological identity of different organs of the plant. Several have in recent years been shown to be due to parasitic fungi, and a somewhat similar phyllody of grain-plants is known to be due to various species of *Sclerospora*, one of the *Oomycetes*. I have not been able to find any record of phyllody being traced to a plasmodium, as appears to have been the case here.



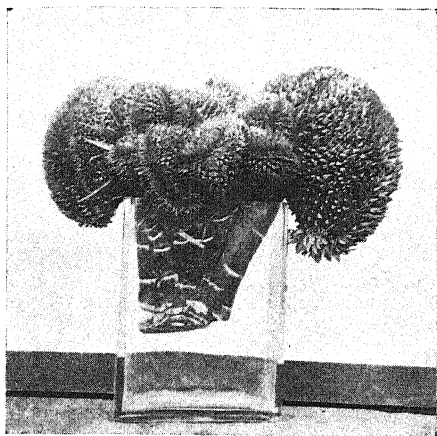


Fig. 1.

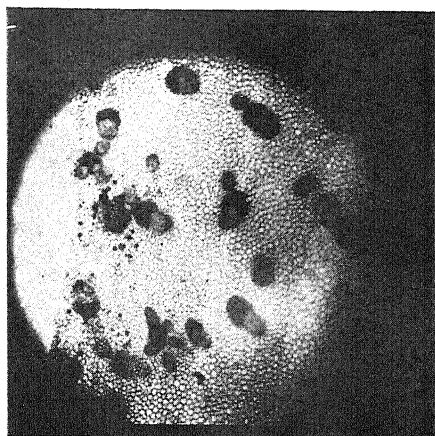


Fig. 2.

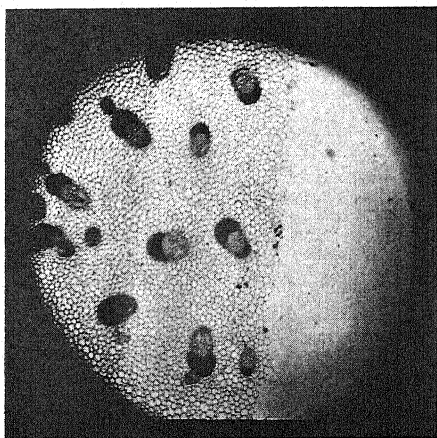


Fig. 3.

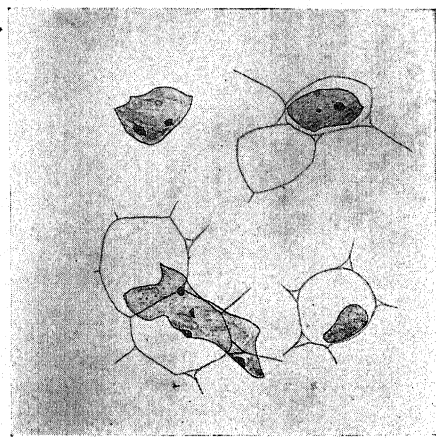


Fig. 4.

16. Notes on the Ecology of the Nilgiri and Pulney
Highland Plateaus.

By P. F. FYSON, B.A., F.L.S., *Professor of Botany, Presidency
College, Madras.*

The science of Ecology as compared with other branches of Botany is so young that it is hardly surprising that little has so far been done on the Ecology of Indian areas.

In this paper an attempt is made to indicate some points of Ecological interest in the Flora of the Nilgiri and Pulney plateaus.

There are two facts of special importance, which appear to the writer to render study of these areas of some interest in relation to Ecological problems; one is their comparative isolation, the other is the uniformity of certain factors which are often of considerable importance. The narrowing of problems is almost always of the greatest value in their solution.

The two plateaus stand mostly between 6,000 and 7,000 ft., though one or two peaks run up to 8,000 ft. The underlying rock is much the same throughout, an easily decomposed metamorphic rock, charnockite, and the subsoil is in consequence very similar all over. We have not to deal with calciphilous or calciphobous species, nor to distinguish between halophytes and xerophytes. This, however, does not exclude local differences in the soil; which may be light and sandy, or clayey, or rich in humus, or in swamps deficient in oxygen. And there is almost every variation in that important ecological factor, the supply of water to the roots—a factor varied still further by dry winds and hot sun on the open downs, as contrasted with the cool shade of the moist wooded hollows. We have also great differences in light, a factor which seems to be of considerable, if not of the first, importance in determining which species should grow in any particular habitat.

I do not propose to enumerate the species which belong to this or that particular type of situation. Useful and necessary as such lists are in the study of Ecology, they belong properly to the paper which is to be read at leisure by those particularly interested, rather than to a paper at a meeting of this Section. It is proposed only to draw attention to one or two special points in distribution and adaptation.

Taking first species of the driest situations: where the soil is very thin, the underlying rock showing through, we find almost always the shrub, *Osbeckia Wightiana*, *Benth.*, and the undershrub, *Anisochilus dysophylloides*, *Benth.*; while *Anaphalis*

Bournei, *Fyson* occurs everywhere on stony hill sides. In *Osbeckia Wightiana* there is no well-marked adaptation which would explain its presence in these situations. In every visible character, except the peculiar scales of the calyx tube and a slight silkiness of the under sides of the leaves, this dry open sun-loving species is almost indistinguishable from *Osbeckia reticulata*, *Bedd.* which occurs in woods and moist ground. The slight silkiness of the under sides of the leaves seems too slight a protection against transpiration to account for the difference in habitat and is matched by the coarse hairiness of the leaves of the other species. This adaptation of hairiness is well shown in several species of *Anaphalis*, *A. travancorica*, *A. Beddomei*, *A. neelgerryana*, *A. brevifolia*, and *A. Bournei*; as contrasted with *A. Wightiana* and *A. aristata* which grow in moist places, and have green glandular leaves, though they also are white underneath. *A. travancorica* and *A. Beddomei* occur as densely branched rounded shrubs along the tops of the precipices which bound the downs near Kodaikanal, where they are enveloped, every afternoon during the summer months, with the dense mist that rises from the plains, and, at other times, are exposed to strong dry winds. In company with other species of *Anaphalis* the leaves hang for a considerable time after they have died, so that the lower stems are thickly clothed with these dead leaves. The suggestion is hazarded that a certain amount of absorption of water may take place from the air entangled in the interior of the bush. *Anaphalis neelgerryana* which grows specially on bare crags on the Nilgiri plateau, but not on the Pulneys, shows the further adaptation of the leaves being closely packed together. In *Anisochilus dysophylloides*, which, as has been mentioned, grows in the driest situations, the leaves are crowded and fleshy and arranged, curiously for a Labiate, in six not in four rows. Smooth fleshy leaves are well shown in *Kalanchoe grandiflora*, *Wight and Arnott*, which occurs abundantly on the Snowdon to Dodabetta ridge on the eastern side of Ootacamund, and very prominently also in two epiphytes, *Peperomia reflexa* *A. Dietr.*, and the orchid *Saccolabium filiforme* *Lindley*. This latter shows the interesting peculiarity of having flowers of different colours on the two plateaus. On the Nilgiris they are pink, on the Pulneys orange streaked with red. No other difference can be made out. Since the plant is an epiphyte, the difference cannot be due to any difference in the mineral salts of the soil. It seems to be a clear instance of a mutational change, all the more remarkable because in cultivated flowers pinks and yellows are not, as a rule, interchangeable; the former colour being usually dissolved in the cell sap, the latter, with red, contained in special plastids.

While on the subject of adaptations to xerophytic conditions, what seems to be a curious anomaly deserves notice.

Blumea hieracifolia, *DC.* grows near streams, often almost in the water and has thick leaves; while *B. neilgherrensis* which grows on the open downs where the soil is often very dry, has thin aromatic and slightly woolly leaves; and another species, not identified, which occurs on the very wettest spots on the downs, has very excessively hairy leaves. Again *Exacum atropurpureum*, *Bedd.*, one of the *Gentianaceae*, grows especially near running water, on rocks near waterfalls and in the beds of streams, and has leaves much thicker than the closely related *E. Wightianum*, *Arnott*, which grows on the open hill sides. It may be that plants which are exposed to the greatest alternation of wet and dryness, as in situations near streams which certainly dry up in the dry months from January to April, have more need of xerophytic adaptation than those which grow in soil that is never so wet and never drier. Otherwise it is certainly curious that there should be this contradiction of so universal a rule.

Coming now to the grassy hill sides where the soil is deep enough to allow of a rich and varied flora as soon as the summer rains begin: the commonest grasses are the purple *Ischaemum ciliare*, *Retz.*, the silky auburn-coloured *Pollinia phaeothrix*, *Hack.*, a coarse hairy-leaved *Arundinella*, and the Stork's head, *Heteropogon* (*Andropogon*) *contortus*, *Beauv.* The smaller herbs have, for the most part, hard and glossy leaves, as in *Polygala sibirica*, *L.*, and are often distinguished by the erect position of the leaves. This is seen in a comparison of *Viola Patrinii*, *DC.* with the shade-loving *V. serpens*, *Wall.*, and *Pimpinella Leschenaultii*, *DC.* with *P. Candolleana*, *W. & A.*, from which it is otherwise hardly distinguishable except by the ripe fruits. Of under shrubs, two species of *Leucas* have narrow hairy leaves, and are, in other respects also, very nearly alike. But one *L. helianthemifolia*, *Desf.* is most abundant on the eastern side of the Nilgiri plateau, near Kotagiri, and also on the Pulney downs near Kodaikanal; the other *L. suffruticosa*, *Benth.* takes its place on the western side towards Pykara. This seems to be a seasonal difference, for the western side is wettest in the summer from the S.-W. monsoon, the eastern side and the Pulneys near Kodai get most of their rain later on in November. The eastern and western sides of the Nilgiri plateau are also distinguished by the abundance of the two shrubs *Dodonaea viscosa*, *Linn.* and *Rhodomyrtus tomentosa*, *Wight*, the Hill-gooseberry, on the former; and of *Hypericum mysorense*, *Heyne*, on the other.

What appears to be the direct effect of the environment in regard to the supply of water is illustrated in a species of *Knoxia*, one of the *Rubiaceae*. This species, *Knoxia mollis*, *W. & A.*, is one of the commonest plants everywhere except in dense shade or on bare rock. It occurs in two quite distinct forms, the one in dry hill sides has a loose corymb of flowers standing

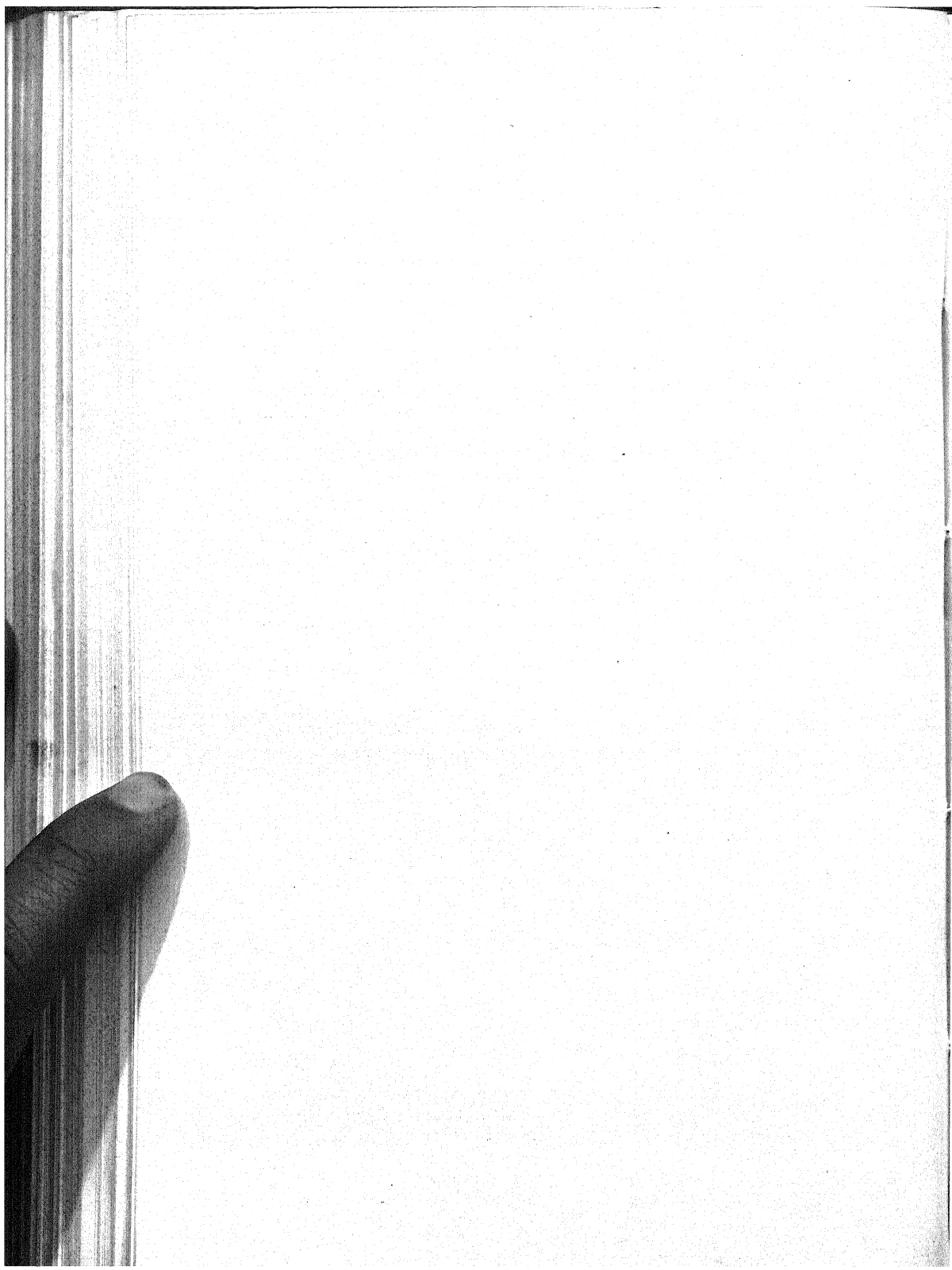
well above the uppermost leaves; the other, which is found on the banks of streams and in the moist ground that borders a wood, has the inflorescence condensed into a rounded mass close down on the top pair of leaves.

Coming now to shade-loving plants a definite difference in the position of the leaves when compared with those of the open downs has already been noticed. They are also in general, as would be expected, much larger than in the open, though not always so. The flowers are either small and inconspicuous or large and white. This is well illustrated in the small epiphytic orchid *Eria braccata*, *Lindl.* which from a flat tuber not half an inch across bears solitary white flowers over an inch in diameter: and also in two epiphytic species of *Coelogyne*, *C. nervosa*, *A. Rich.* and *C. odoratissima*, *Lindl.* when compared with *C. glandulosa*, *Lindl.* which grows on open rocky slopes.

These epiphytic orchids have, as often happens, tubers in which water is stored, and in *Eria braccata*, *Lindl.* (*E. reticosa*, *Wight*) the tubers which are quite small, less than half an inch across, are covered with a raised network of vascular bundles from between which the parenchymatous tissue has decayed away. This fine network would hold water that ran down the branch of the tree on to the tubers. Two orchids which grow on exposed and rocky slopes are sharply contrasted in regard to their water-storing adaptations. *Coelogyne glandulosa*, *Lindl.* has large banana-shaped tubers which swell during the rains and slowly shrink in the dry weather. *Aerides crispum*, *Lindl.*, which grows in much the same sort of locality, has no tubers, but the long thick roots run laterally along the natural ledges of rock and form a collecting ground for soil and debris washed down from above. In the earth so collected various small herbs and grasses take root and form a compact sod, two to six inches deep, in which water is most effectively retained and easily available for the orchid. The roots of this plant have a velamen exactly similar to that of epiphytic species, in which alone the velamen is usually the subject of notice. It seems probable that the usually accepted explanation of the value and function of the velamen should be modified, and that it should be regarded not merely as a modification for the special purpose of absorbing intermittent rainwater, but also as being an absorptive tissue of use to roots in soil; and of special value as being much less easily damaged by desiccation than are the root-hairs.

These orchids seem also to illustrate the direct effect of illumination on distribution. The two species of *Coelogyne* mentioned as shade plant occur, as far as I know, only as epiphytes in the shade of trees; one, that just mentioned, only on absolutely open rocky slopes. Of *Aerides* also one species, *A. radicosum*, *A. Rich.*, is only an epiphyte, the other *A. crispum*, *Lindl.* grows only on sunny rocks. The leaves, stems, tubers and other

vegetative parts are almost exactly the similar. Between the two species of *Aerides*, in fact, the only real difference lies in the shape of the flowers. Taken in conjunction with what has been pointed out in regard to the two species of *Pimpinella* and of *Osbeckia*, of which one in each case grows on the dry hill sides, the other only in damp and sheltered spots, and with what is well known of the many other species which occur only in special situations, it would seem that in the diagnosis of species greater stress might well be laid on physiological characteristics of this kind, not indeed to the exclusion of morphological characters but in addition to them. In this connection it may be pointed out that if there is considerable latitude in the conditions under which many plants will thrive in nature, so also is there in the habit of the plant, the shape and hairiness of the leaves and in the other external features on which species are founded. Much of the work of Herbaria is in the critical re-examination of species which have been lumped together or separated by previous workers. And it must be conceded that the differences between species is ultimately a physiological one, and that the morphological characters are but expressions of the living substance within. Physiological differences cannot, of course, be determined in the herbarium where ultimately the critical determination of species must be made, though they could be made use of there, if known; but for the identification of species in the field and their recognition from printed descriptions, the inclusion, as part of the diagnosis of such characters, would often be of great assistance to the collector. And reciprocally were more stress laid on these, more notice would be taken of them by collectors and advance on Ecological lines would be rendered more rapid and secure.



17. The Dramas of Bhasa: A literary study.

By A. M. MEERWARTH.

The following is a lecture delivered by the author in the rooms of the Asiatic Society of Bengal on the 6th July, 1917. It is an attempt to show some prominent literary features of a collection of dramas edited recently in the Trivandrum Sanskrit Series and attributed by their editor to Bhasa, a famous dramatist anterior to Kalidasa.

Seven years ago Mr. Ganapati Sastri, the learned editor of the Trivandrum Sanskrit Series, discovered in Travancore a palm-leaf manuscript containing ten dramas. Two more dramas were found on another manuscript, also in Travancore. Systematic researches yielded more material, and finally the lucky discoverer saw his pains rewarded by a series of manuscripts containing thirteen dramas not known before. No indication was, however, given in the works as to the name of their author. Mr. Ganapati Sastri undertook therefore the difficult task to collect all the evidence available—unfortunately it is very scanty—and to come to a conclusion as to the author and the historical period of the dramas. His conclusions are: (1) The thirteen dramas have been composed by one and the same author; (2) this author is Bhasa, whom Kalidasa himself calls a famous ancient poet; (3) this author lived at a very early period, at any rate before Buddha.

If I speak in this lecture about the dramas of Bhasa, I do so only for convenience's sake; it does not mean that I share the learned Sastri's opinion. The time has not yet come to give a final answer to the questions about the author or the authors. Only so much can be said with absolute certainty, that the dramas are later than Buddha, as Buddhist monks play a part in them and are quoted several times. It is, however, not my intention to discuss these intricate problems in a popular lecture. I wish to draw the attention of non-Sanscritists to an unknown ancient poet of first magnitude, and discussions of the Shakespeare-Baconian type have a fatal tendency to kill the interest in the subject. Let me therefore acquaint you with some of these masterpieces and point out their main characteristics.

The subject-matter of our dramas has been taken from various sources. Two are what we may call historical plays. Their titles are "Pratijnayaugandharayanam" or Yaugandharayana who is true to his promise, and "Svapnavasavadattam" or Vasavadatta, the dream-apparition. It is true, they do not relate incidents of which we have any historical

knowledge; but we can with a great degree of certainty identify several characters in these plays as well as their historical period. Both plays are without doubt the work of one author. They have the same peculiarities of style and language. Even more; the second play, "*Vasavadatta*," is the sequel to the first one and contains several allusions to "*Yaugandharayana*."

The historical setting is the period before the unification of Northern India by Candragupta Maurya, a period with which we have been made familiar by the Buddhist scriptures. The Ganges valley and the adjacent country was split up into a number of petty principalities, which were in a constant state of rivalry and war. The greater ones, especially Magadha and Avanti-Ujjaini, tried to reduce the smaller ones to a state of feudatory dependence. The smaller ones, as far as they did not voluntarily surrender, used every possible means to save their liberty. Spies and bribes were common, political marriages were considered to be of great importance. On this historical background our poet has painted a number of magnificent human portraits, the chief figures of our two plays. For this is one of our poet's main qualities; he has the power to draw living, breathing, human portraits of great psychological reality, and does it as a true dramatist by action and not by verbose description.

The plot of the first drama is the following: Pradiota, the warlike king of Avanti, to whom his contemporaries gave the proud title of Mahasena, i.e. Great Warrior, has spread his political influence over all the princes around. Only the small country Vatsa-Kausambi, ruled by prince Udayana, has managed to remain independent. This is unbearable to Mahasena's pride and interferes with his "world-policy." But he is rather afraid of Udayana's prowess and still more of the skill of Yaugandharayana, Udayana's chief minister. He has therefore recourse to a ruse. Udayana besides the usual qualities of a stage prince, as beauty, prowess and an excellent character, has a special gift, hereditary in his dynasty. He possesses a *veena* the sounds of which tame even the wildest elephants. He is naturally very proud of this wonderful gift and does not miss an opportunity to use it. On this passion of the prince Mahasena builds his rather simple plan. It is a variation of the Trojan horse-trick. A huge elephant is made of wood, painted blackish-grey and placed so skilfully in the dense jungle that the deceit can be discovered only at a very short distance. Behind the elephant in the jungle a force of select warriors is concealed under the command of Mahasena's best general. Udayana promptly falls into this trap. Too proud to tackle the animal with all his hunting-companions, whose number would have more or less equalled the number of the enemies, he advances towards the elephant accompanied only by a few friends. As soon as the prince is near enough, Mahasena's men

fall upon him. He puts up a heroic fight, but the odds against him are too heavy. All his followers except one are killed and after a long resistance he sinks to the ground, exhausted and unconscious. Covered with wounds he is taken to Ujjaini.

Yaugandharayana learns too late of this plot to warn his master, but he is decided to save him at all costs. Open war being impossible with the prince as a hostage in the enemy's hands, ruse must be pitted against ruse. A hint is given to the minister in a miraculous manner by the divine sage Vyasa, who appears and leaves a madman's garb behind him. This serves him as a disguise, and together with another minister in the cloak of a Buddhist monk, and the prince's buffoon who dresses as a religious mendicant, he steals himself into Ujjaini to release his master.

The young king has meanwhile met with an exceedingly chivalrous treatment at the hands of Mahasena. A brave fighter himself, the king of Avanti appreciates gallantry in his enemy. He keeps his royal prisoner in the coolest part of the palace, and Udayana recovers quickly. Meanwhile the intrigue of the faithful servants develops. Yaugandharayana has gradually filled the palace and city with his spies and devises a cunning plan which he explains to his friends at a secret meeting. But here a new difficulty arises. By some accident Udayana has seen the king's lovely daughter Vasavadatta and she has seen him. The inevitable happens; the two young people fall at once in love with each other. Udayana naturally refuses to leave his prison which the visits of his beloved convert into paradise. He puts forth his ultimatum; either I flee together with Vasavadatta or I remain prisoner. Yaugandharayana finds a way also out of this difficulty. One of his men is made mahout of Vasavadatta's elephant, and on a day previously arranged the loving couple elopes. The faithful minister at the head of the small force which he has secretly collected in Ujjaini covers their flight, manfully fighting against overwhelming odds; but his sword is broken and he has to surrender to his enemies. He is prepared to suffer the utmost penalty for his daring exploit. But everything ends in happiness and peace. He is informed that king Mahasena prefers not to play the heavy father, that he forgives the lovers and will have the proper marriage-rites performed over their portraits. Needless to say that the queen, Mahasena's consort, has a considerable share in this noble decision.

The central figure of the play is the faithful minister. He is so lively drawn, he shows so much individuality that one might be tempted to see in him the portrait of a statesman personally known to our poet. His predominant feature to which all other qualities are subordinated is his unwavering faithfulness to his master. This is beautifully expressed in his promise to save Udayana (1st Act, sloka 14):—

In Mahasena's town I'll be with him,
 In prison with my lord, in jungle deep.
 Yea, should they kill him, die with him I will
 To be his servant in the world to come.

This splendid devotion keeps him to his dangerous task and allows him to despise death. When after his last heroic fight he is taken to Mahasena's palace, wounded and in fetters, he says :—

I've helped the king of Vatsa to escape.
 'Tis true I am in chains and doomed to die,
 Because my sword has failed me in my need ;
 But I brought freedom to my lord and bliss
 And thus I say : the victory is mine. (4th Act, sloka 5).

At the same time he has all the qualities necessary for his dangerous exploit. Thus Udayana's mother speaks of him when she implores him to save her son : " He is my son's friend and councillor ; he is shrewd ; he is not afraid of danger ; he does not lose heart before obstacles ; he does not despair when deceived by the enemy ; the blows of fate do not discourage him." On the other hand, though he is not an old man he has not much understanding for the romantic sides of life. Love he thinks rather a nuisance and an obstacle to his plans. The affairs of his master's heart have exactly as much interest for him as they are of value for the state. As a matter of fact he could well say that he was the state ; for his royal master had all the qualities of a gallant knight but none of a ruler. In Yaugandharayana our poet has drawn a stern, manly figure. A ripe strong character with decidedly manly feelings. Love to his master and friend, a high conception of his own post and its duties, coupled with a strong desire for fame, are the mainsprings of his soul. His antagonist is Pradyota Mahasena. He is a kind of Napoleon in a small way. But the poet did not intend to show us Mahasena the conqueror. Only once the king mentions his political successes :—

" The mighty princes follow me like slaves ;
 Their golden crowns are coated with the dust,
 That on the road strike up my horse's hoofs." (Act 2,
 sloka 3).

We get acquainted rather with Mahasena the man, the father and husband. The poet has chosen a very interesting situation to show us some of the intimate traits of the king's character, and to allow us at the same time a glimpse into the family life of his time. Vasavadatta, the king's only daughter, has attained marriageable age ; a number of suitors have asked for the hand of the princess, but Mahasena cannot come to a decision. He explains the reasons for this hesitation to his chamberlain :—

Mahasena. I wish the man whom for my child I choose
To be the scion of a famous race.
He should be soft of manners, kind of heart ;
This is of great importance for a husband.
I want him handsome ; for it's women's way
To love their husband more when he is fair.
And lastly, gallant should he be and strong
To ward off danger from his tender bride.

Chamberlain. I am afraid in our time all these virtues together can be found only in Mahasena.

Mahasena. I think, therefore, all a father can do and is bound to do is to choose the husband for his child with the greatest care. All the rest we must leave to fate. At any rate that's how I have learned it. However the time when the daughter is given away brings always misery to the mother. Go therefore and ask the queen to come here.

Chamberlain. Very good, your Majesty. (*Exit*).

Mahasena. I must say since this embassy from the Maharajah of Benares has arrived I am constantly thinking of Shalankayana, (this is the general who has been sent to capture Udayana). How long is it since he went to capture the king of Vatsa ? And no news up to now ! No doubt all the councillors of the king watch with anxiety the spot where he is hunting, and every precaution has been taken to save him.

(*Enter queen and chamberlain*).

Queen. I greet you, my lord.

Mahasena. Pray, be seated.

Queen. As it pleases my lord. (*Sits down*).

Mahasena. Where is Vasavadatta ?

Queen. She has gone to the northern wing, to the music-room and is practising on the *veena*.

Mahasena. She is studying music ? Where does this new whim come from ?

Queen. She happened to see, how Kanchanamala played the *veena* and now she's got it into her head to learn it too.

Mahasena. Yes, she is quite a child still.

Queen. And she asked me to tell you—

Mahasena. Well, what is it ?

Queen. She says, I wish father would give me a teacher.

Mahasena. Goodness, the girl is about to be married and talks about studying. Let her husband teach her.

Queen (*weeping*). Has the time really come to give my daughter away ?

Mahasena. Here you are. You never gave me a moment's peace : our daughter must be married, our daughter must be married ! What is it you are crying for now ?

Queen. I want her very much to be married. But to part with her is so hard. To whom will she be given?

Mahasena. We have not yet arrived at any decision.

Queen. Not yet?

Mahasena (aside). That's just the trouble:

'Tis shameful if the child remains a spinster;
And if she leaves her mother's arms, it's tears.
Thus love and duty wring a mother's heart;
Whate'er she does it's misery for her.

(Aloud). Anyhow our Vasavadatta has attained the age when she should attend to her father-in-law. To-day another embassy has arrived, Jaivanti, the teacher of the Maharajah of Benares. I must say this suit rather attracts me. All I have heard about the prince is very much to his advantage. *(Aside)* She does not say anything. Of course how can she speak when she is crying. Well I shall tell her every thing in detail. *(Aloud)* Now listen my dear, I want to tell you which princes wish to marry into our family.

Queen. What is the good of going into all these details? Give her to a good man with whom she won't be unhappy afterwards.

Mahasena. Oh no, this won't do. It's easy for you now to say, Chose a husband. But who will have to bear the blame if things go wrong? Kindly choose yourself, my queen. Listen now. There are several princes who wish to marry into our family; the King of Magadha, the princes of Benares and Bengal, the Lords of Surashtra and Mithili and the prince of Shurasena. All are very eligible suitors. Each of them has highly attractive qualities. Now whom do you want to become our daughter's husband?

(Enter chamberlain in great hurry).

Chamberlain. The King of Vatsa.

With this dramatic effect—the chamberlain merely wants to announce the capture of Udayana, but anticipates without knowing it the final result—ends this scene. It is a pretty example of our poet's power to draw a life-like picture with a few deft dashes.

Here we have the loving and worried father, the courteous husband, patient and full of understanding for his wife's troubles; on the other hand, the mother led only by instincts and the force of custom; even the flattering courtier is clearly sketched with a few words. Mahasena is a man of impulses. He is quick to hate and as quick to forgive. In his first joy over the capture of Udayana he orders that the prisoner should be shown to all the people "like a lion captured for sacrifice." But as soon as he hears that the prisoner is severely wounded, his generosity, which is very often a marked feature of quick-

tempered persons, lets him at once forget his hatred. He is himself astonished at this sudden change of his feelings and says :—

How strange it is : at first when he was proud,
I hated him. But when they brought him here,
I could not find ill-feeling in my heart.
And since they told me of his sorry plight,
That he is wounded and his life in danger,
I feel the deepest sympathy for him.

He repents his former hostility with great vehemence and cannot do enough to make Udayana's fate easier. The finest trait is his order that no mention of the unlucky fight should be made in the presence of the prisoner. Throughout it was the poet's aim to give us a psychological study not so much of a king as of a gentleman. Mahasena is certainly one of the liveliest and truest characters of Indian literature, lovable, simple and straight.

"Yaugandharayana" is an essentially manly drama. There are only two feminine characters, the queen and a servant. Both are of little importance. Manly passions, manly aims strive with each other. Even Udayana's romance is introduced only as retarding moment.

"Vasavadatta, the dream-apparition" is, on the other hand, essentially feminine. Its subject is the self-sacrificing love of a devoted wife. Vasavadatta, Mahasena's daughter, ranks with Savitri, Sita and Damayanti as an exalted expression of the Indian ideal of a wife's devotion.

Udayana and Vasavadatta have been married for some time and their happiness is boundless. But the political enemies of the King of Vatsa have no understanding for romance, and one of them overruns the state. Udayana is compelled to flee, and lives for some time in Lavanaka, a frontier town. The situation does not improve, and Udayana's ministers come to the conclusion that without help from outside Vatsa would cease to exist. The only hope is to win the support of the strong power of Magadha. This can only be done if Udayana marries the sister of King Darsaka, Padmavati. But here arises a difficulty. He cannot make the princess his first wife because he is already married; on the other hand, he cannot ask the princess of Magadha to be his second wife. Of course the author of this marriage-scheme is our friend Yaugandharayana. He finds again a way out of the difficulty. It is a cruel solution; but when the interests of his state are at stake, he does not spare anybody, least of all himself. Vasavadatta must disappear for some time. She must disappear in a manner that Udayana believes her dead, and can honestly ask Padmavati to be his wife. Vasavadatta is made to agree to this plan. How, we do not know, as all this happens before our drama.

But she consents to sacrifice her happiness for the sake of her husband's honour and her adopted country's existence. On the pretext of a hunting expedition Udayana is removed from Lavanaka, and meanwhile the palace of the royal pair is burnt down. The young queen and Yaugandharayana leave the country in disguise. The general opinion is naturally that both have found their death in the flames. When Udayana is informed of the disaster he nearly dies with grief. But thanks to the efforts of his faithful ministers he gradually recovers. Meanwhile the fugitives have left Vatsa behind them. Vasavadatta is disguised as a Brahmin woman under the name Avantika, while Yaugandharayana, who accompanies her, is dressed as a sadhu, and calls himself her brother. They arrive in a grove near Rajagriha, the capital of Magadha, at the moment when Padmavati pays a visit to her brother's widowed mother who has retired there. The young princess grants a boon to everybody present, and Yaugandharayana seizes the opportunity to carry out his scheme. It is of great importance that the two queens should become friends. This would make the final revelation of the truth less painful to all concerned. Therefore he asks Padmavati to take his sister under her protection until his return from a pilgrimage. He adds that his sister's husband has gone for a journey. The whole plan is very cunningly concocted and worthy of the crafty diplomat. It is true his conscience is sorely troubled over the sordid means which he has to use; but it is the saving of the state and the fulfilment of the will of fate. For it has been predicted by the astrologers that Padmavati should become the wife of Udayana.

This young princess begins to love the king of Vatsa from the moment she hears of his bereavement and his grief. Pity is always a short-cut to tenderer feelings. She would not refuse to comfort the poor widower should the occasion arise. At the same time Vasavadatta's beauty, noble bearing and sadness awoken in the warm-hearted, enthusiastic girl a great friendship for her. Vasavadatta too feels deeply attracted by the lovable princess.

Thus Vasavadatta lives at the court of Rajagriha as Padmavati's friend. After some time Udayana visits Darsaka, Padmavati's brother, and king of Magadha, on a political mission. He impresses the latter so much that he is offered the hand of Padmavati. Udayana accepts, seeing the great political advantages of this union. Padmavati is overjoyed, and the wedding takes place after a very short time. But the poet keeps our interest concentrated on the drama which takes place in the soul of Vasavadatta. Her love, the strong passion of the wife who has been happily married, struggles against her self-imposed duty and her affection for Padmavati. She is spared nothing; she has to listen to the exuberant talk of the

young bride who is full of the virtues of her husband. It costs her tremendous efforts not to give herself away, though the strain is sometimes heart-breaking. The following short scene—the third Act of the drama—may give an idea of the masterfulness and delicacy with which our dramatist has drawn the psychological picture of this heroine.

THIRD ACT.

SCENE : *The Garden of the Royal Palace.*

(*Enter Vasavadatta : she is sad and thinking deeply.*)

Vasavadatta. The great court-yard of the ladies' quarters resounds with the merry noise of the wedding. I have left Padmavati there, and have come here into this quiet garden. Perhaps I shall be able now to overcome the grief which fate has laid upon me. O, how miserable I am. My husband belongs now to another woman. I must sit down. (*She sits down on a stone bench.*) Happy are you, wife of the Chakravaka-bird. You cannot live without your husband, you die. And I cannot throw this life away. Only the desire to see my lord keeps me alive.

SECOND SCENE.

(*Enter servant with flowers in her hands.*)

Servant. Where has the lady Avantika gone ? (*Searching*) Aha, there she is, sitting on the stone-bench that is overhung by the creeper Priyapu. She looks so unhappy. She must have very sad thoughts. Like the moon enshrouded in mist she looks, and not a single jewel does she wear on her dress. I'll go to her. My lady! Avantika! I'm looking for you all the time.

Vasavadatta. What is it you want from me ?

Servant. The queen has said, "Avantika is of high caste, she is devoted to us and is very skilful. Let her plait the wedding-garlands."

Vasavadatta. Yes; and for whom am I to plait these garlands ?

Servant. For our princess.

Vasavadatta (aside). Even this I must do. O gods, you are cruel.

Servant. Don't think about other things now, my lady. The bridegroom is already leaving the Crystal-bath. Please, please plait as quickly as you can.

Vasavadatta (aside). I cannot think of anything else. (*Aloud*) Have you seen the bridegroom, my girl ?

Servant. Oh, yes, we have looked at him; the princess out of love, and we out of curiosity.

Vasavadatta. Tell me, what is he like, the bridegroom?

Servant. O my lady, I have never seen such a man in my life.

Vasavadatta. Tell me, good girl; is he really as handsome as that?

Servant. He is just like seven gods of love only without bow and arrows.

Vasavadatta. That's enough.

Servant. Why do you stop me?

Vasavadatta. It is not meet for me to listen when another woman's husband is praised.

Servant. Now work quickly, my lady, work quickly!

Vasavadatta. Give me the flowers. (*Working, aside*) Here I am plaiting. Oh, how miserable I am. (*She chooses a flower and gazes at it*) What do you call this flower?

Servant. We call it "husband's life."

Vasavadatta (aside). Of these I must put many into the garland both for Padmavati and myself. (*Choosing another flower*) And what do you call this flower?

Servant. We call it "rival's death."

Vasavadatta. These we need not take

Servant. Why?

Vasavadatta. The king's first wife is dead, so we do not want this flower.

THIRD SCENE.

(*Enter second servant.*)

Second servant. Make haste, my lady, make haste! They are already leading the bridegroom into the inner court.

Vasavadatta. Alas! Is this true? Here take it (*gives her the garland*).

Both servants. How beautiful, my lady. But now we must go. (*Exeunt.*)

Vasavadatta. They are gone. (*Weeps*) Oh misery, misery! My husband belongs to another woman. I don't want to think. If I only could fall asleep I might perhaps forget my grief. (*Exit.*)

The princess is married and happy. Udayana too is sincerely fond of his beautiful, merry bride; but he cannot forget Vasavadatta, his first love, with whom his soul is bound up for ever. In the fourth Act this struggle between the old love and the new one finds expression in a scene which has few equals in dramatic tension. Padmavati and her friend are taking a walk in the royal gardens, when Udayana appears accompanied by his friend and buffoon Vasantaka. Modesty forbids the ladies to meet the men; but at the same time there is no way out of the garden. Thus Padmavati and Vasavadatta are compelled to hide themselves behind a jessamin bush and to listen to the confession which Udayana makes to his friend about the

state of his heart. He does not know of the ladies' presence, Padmavati does not suspect her friend's identity, Vasavadatta strives to conceal her emotions, her joy that her husband still loves her, her compassion with his grief—only a genius can conceive a psychological drama of such deep intensity and handle it in the masterful manner of our poet.

Udayana is convinced in the heart of his heart that Vasavadatta is not dead. He is not conscious of this conviction, but in moments of forgetfulness he speaks of his first wife as if she were still alive. His belief is strengthened by the wonderful scene of his dream which has justly given the title to this drama.

Padmavati has an attack of headache, and Udayana is informed that she has gone to a pavilion to rest. He goes there but does not find her. Awaiting her arrival he lies down on a couch and falls asleep. Vasavadatta also goes there to see and comfort her friend. It is evening, and the pavilion is only dimly lit by a lamp. She sees somebody lying on the couch and thinks it is Padmavati. She decides to wait until her friend awakes and sits down on the couch.

"How strange," she says, "from the moment I am sitting near her my heart has become quite calm. How good; she breathes quietly. It seems her illness has already passed. Darling! She is lying on the same couch on which I am sitting; she seems to ask me, 'Embrace me!' Really why should I not lie down by her side?" (*Lying down.*)

Udayana (dreaming). O Vasavadatta!

Vasavadatta (jumping up). Ha, my husband! It is not Padmavati. Has he seen me? If he has recognized me then all my sufferings, all I promised to Yaugandharayana, has been in vain.

Udayana (still dreaming). O princess of Avanti!

Vasavadatta. How glad I am. He is dreaming of me. Nobody is here. I can stay for a while and gladden my eyes and my heart.

Udayana. O my beloved! My darling pupil! Speak to me!

Vasavadatta. I am speaking to you, my lord, I am speaking to you.

Udayana. Are you angry?

Vasavadatta. Oh no, oh no, only very unhappy.

Udayana. If you are not angry, why do you not wear your jewels?

Vasavadatta. How could I wear them?

Udayana. Do you remember how we parted?

Vasavadatta (sadly). Don't speak of it! Even here we are far from each other.

Udayana. Forgive, my love; I have been away from you for such a long time.

Vasavadatta. I have been here far too long. Somebody

might come and see me. I must go. I will only lift up the hand of my lord; it has slipped from the couch. Then I shall go. (*Does it; exit.*)

Udayana (jumping from the couch). Vasavadatta! Stay! (In the darkness he runs against a door-post.) Oh misery!

Why does this wretched post stand in my way,
And hurts me when I want to follow her!
Was this the mocking vision of a dream?
Was it fulfilment of my heart's desire?

Udayana's suspicion that his wife is alive amounts now almost to conviction, whatever proofs his buffoon Vasantaka may adduce to the contrary. However, before he can follow up his suspicion, his royal duties call him to another field. Yaugandharayana's clever policy bears fruit, and Darsaka unites his forces with the army of Vatsa. Together they shatter the host of the invader, and Udayana returns victoriously to his country. Here the intrigue is revealed. The king is overjoyed to see Vasavadatta again, he forgives Yaugandharayana, understanding that he has acted for the country's good. Padmavati who, as things turn out, is the only loser, rises magnificently to the occasion; she is quite willing to share Udayana with her beloved friend and to respect Vasavadatta as her elder sister and the chief queen.

"*Svapnavasavadattam*" is essentially a psychological drama. The plot itself is interesting enough to satisfy any taste keen on sensations. But it is of little importance when compared with the deeply stirring drama that goes on in the soul of the heroine. It is her grief which calls up our compassion; it is the struggle in her soul which keeps us interested. The other figures, though each of them masterly finished, are only the back-ground on which Vasavadatta is drawn. Padmavati, the lovely, kind and merry girl on the threshold of womanhood, serves as a sharp contrast to the sad Vasavadatta, the ripe woman who has suffered much and thought deeply. Udayana, with whom we make a personal acquaintance in this play, is less individual. He is a good-looking, attractive, easy-going prince with a warm, loving heart. His part throughout both plays is to be loved and to give those who love him an opportunity to show their good qualities. Clearly the poet did not intend to make him a leading personality in either drama.

The parallel with *Dushyanta* and *Sakuntala* suggests itself. But except the fact that in both dramas the royal lovers are separated for some time, the two master-pieces have nothing in common. Neither in subject nor in treatment. If our author is a psychologist *per excellence*, the same cannot be said of Kalidasa. As a matter of fact the creator of *Sakuntala* makes psychology in the usual sense impossible by introducing the

supernatural influence of the Rishi's curse. Sakuntala is just a beautiful flower, very fragrant and lovely, but only a flower. Vasavadatta is a woman, chaste yet passionate, devoted yet able to understand that she can show her devotion best by leaving her husband.

I certainly do not wish to detract from the beauty of Kalidasa's master-pieces. He will always remain the unsurpassed master of the word. But he is a born lyric, and his dramas are a sort of string to keep together the splendid pearls of his lyrics. They lack action, they are stationary. The language of our author is simple, his colour-scheme is poor. He is terse and sparse in his expression. He tells us more by the things he does not say, than by the things he says. He is the Master of Silence. His style has few descriptions and similes. His comparisons are not elaborate; and yet these dramas have the same charm which holds us captive before the frescoes of Fra Angelico even after we have satiated our eyes with the rich tints of Raphael or Titian.

This seeming defect is made up for by the dramatic life which pulses in these plays. Everything is action; action in the widest sense. In Yaugandharayana it is more external. A swift movement towards the final goal, hardly stopping to throw in a moral maxim for the benefit of the public. Even the report of the messenger which informs Yaugandharayana of Udayana's capture, is instinct with this dramatic force. One is reminded of the famous message in Aeschylus' "Persians." In "Vasavadatta" where the action is psychological there is also no stopping, no delay.

The language of our poet is simple and easy. It is remarkably free from conventionalities, and has the natural charm of a living language. The persons of these dramas speak as we expect them to speak, in a natural realistic manner. The next approach to the language of our plays is the Sanskrit used in the epics. I do not wish to anticipate the results of a future research; but if Kalidasa's poetry has been justly connected with the elegant, somewhat effeminate, art of the Gupta period, I am inclined to see in our poet the same traits of manliness and force, combined with simplicity and realism, which are characteristic of the art of the Kushana period. To put the respective position of Kalidasa and our poet into the form of an antithesis: Kalidasa is classical elegance and lyricism, our poet is realistic simplicity and dramatism.

"Pratijnayaugandharayanam" and "Svapnavasavadattam" serve in a marked degree to illustrate this thesis, but not they alone. In other dramas of our collection we find the same distinguishing qualities. Six plays take their subject-matter from the "Mahabharata." Five of them are one-Acters; one, the "Pancharatnam" or the "Five Nights," has three Acts.

Three of the one-Acters, namely "The Message," "Gatot-

kacha as Messenger" and "The Breaking of the Thigh," form a tragical trilogy. I might call them "A Tragedy of Pride." It has its parallel in the Sophoclean "King Oedipus." The central figure is Duryodhana, the hero of the Kauravas. Proud of his power and elated by success, he thinks himself justified to violate the laws of humanity and to scorn the reverence due to the gods. In the "Message" he revels in memories of Draupadi's shame and the five Pandu brothers' humiliation. He illtreats Krishna who comes as an ambassador from the Pandavas with an offer of peace. He does not hesitate to lure the boy Abhimanyu, his own nephew, into miserable death. It is true he acts chiefly under the influence of the evil genius of the Kauravas, Shakuni the king of Gandhara. But still the guilt is his. And finally he is slain by Bhima who uses foul play and wounds him mortally under the waist with his mace, smashing Duryodhana's thighs. The dying hero is alone on the vast battlefield. Face to face with death, he sees the wickedness and folly of pride. He understands that it is a crime to cause war and bloodshed; he implores Balarama, who wishes to avenge him, to desist from further useless murder.

Dhritarashtra, his blind father, and his mother Gandhari, his two queens and his little son Durjaya, search for him on the vast battlefield. Durjaya, who is tired, catches hold of his grandfather's clothes.

Dhritarashtra. Who is this? Who is pulling my clothes to show me the way?

Durjaya. That is me, grand-daddy, Durjaya.

Dhritarashtra. Durjaya, my child, search for your father!

Durjaya. But I am so tired.

Dhritarashtra. Go, you will rest on your father's lap.

Durjaya. I'll go, grand-daddy. (*Searching*) Daddy! Daddy! Where are you?

Duryodhana. Alas, why has he come?

My love to him has always been my heart's
Most cherished joy, whatever fate befell me.
This love is scorching now my soul like fire.
He has remained in blissful ignorance
Of pain and grief, my Durjaya, my son,
Who was so fond of nestling on my knees,
What will he call his wretched father now,
Beholding him thus dying and prostrate?

Durjaya. Ah, there is the king; he is sitting on the ground.

Duryodhana. Why have you come, my son?

Durjaya. They say, you are letting us wait.

Duryodhana (aside). Oh, how the love to my son hurts now I am in this misery.

Durjaya. I want to sit on you, daddy, may I? (*trying to climb on him*).

Duryodhana (in great pain, keeping him off). *Durjaya* !
Durjaya ! O God ! How this hurts !

He was my joy, a pleasure to my eyes,
 He soothed me like the full moon's cooling rays,
 And now like red-hot iron burns his touch ;
 Is this thy cruel will, relentless fate ?

Durjaya. Why won't you let me sit on you, daddy ?

Duryodhana. Sit near me, sonny, somewhere on the ground,
 I'll be no more the seat you liked so well.

Durjaya. Where are you going, King ?

Duryodhana. To the place where my hundred brothers
 have gone.

Durjaya. Take me with you, please !

Duryodhana. Go, my child, speak with Bhima.

Durjaya. But we must go now, king, they are searching
 for you.

Duryodhana. Who, sonny ?

Durjaya. Grandfather, grandmother and the ladies.

Duryodhana. Go, my boy ; I am not strong enough to walk.

Durjaya. I'll carry you, daddy.

Duryodhana. You are too weak, my child.

Durjaya. Hallo, grandfather ! Here is the king.

(*Enter Dhritarashtra, Gandhari and queens*).

It seems to me this little scene which I have given as an illustration bears the stamp of the master who has created the garden scene or the dream-scene in "*Vasavadatta*." But the dramatic power of the ensuing finale has no parallel either in the remaining twelve plays or in Indian dramatic literature. *Duryodhana* consoles his despairing parents and wives. He pleads passionately with *Ásvatthama*, *Drona*'s son, not to continue the war. He curses the pride of the warrior caste, the root of all this criminal bloodshed. At last his soul leaves the earthly surroundings, the splendours of heaven open themselves to him and he enters eternal peace.

Duryodhana, I should say, comes nearest to the idea of a tragic hero with which the Greek tragedy has made us familiar. He produces those feelings of fear and compassion which Aristotle postulates for the tragedy. He is a great spirit who in his pride over-estimates himself and, violating the laws of god and men, comes to grief. But in his fall he finds his purification. He reaches a higher plane of morality. Under the strokes of fate his soul lifts itself up to thoughts of peace and forgiveness which had been unknown to him before. In the character of *Duryodhana* the author stirs up the very depths of human soul. The poet is logical to the end, and does not hesitate to show us the hero's death on the stage though this is absolutely

against all rules and usage of the Indian drama. In this intrepid logic lies the force and beauty of his psychology.

Yaugandharayana, Mahasena, Duryodhana and Vasavadata are instances of Bhasa's ability to show the lights and shades, the ups and downs of human soul. These heroes lend themselves to psychological characterisation because they are human beings with human strength and weakness.

In a far more difficult position is the dramatist whose hero is a paragon of perfection, an ideal. This is the case in the two Ramayana dramas, "Pratima-nataka," or the "Drama of the Monument" and the "Abhisheka-nataka," or the "Drama of the Anointment." Their hero is Rama, the perfect man, the ideal of a son, husband, king, fighter, etc. His perfection is the result of his divine origin; he is an incarnation of Vishnu. His main quality which has always attracted the Indian mind more than any other of his virtues is his filial piety. It is the main-spring of his character. This spring is touched by our dramatist to enliven the figure of his hero. He cannot show us any failing, or wavering, or even struggle against selfish instincts. This would not have been in keeping with the canonical conception of Rama. No, the poet contrasts Rama's piety with Ravana's baseness, and makes the hero's filial piety the indirect cause of Sita's abduction and all the misery which ensues. It is significant that in order to bring out this dramatic contrast and to deepen the psychology of his hero the dramatist has changed the plot of the epos. In the "Ramayana" Ravana lures Rama away from his hermitage by showing him the golden-sided deer, and by playing on his hunting instincts. In the "Pratimanataka" the following takes place. On the anniversary of his father's death Rama wishes to do his duty as eldest son and to offer the prescribed sacrifice to the spirit of his parent. But the forest yields nothing wherewith to make an offering worthy of the departed king. While he discusses this difficulty with Sita, enters Ravana who has overheard the conversation without being seen. He introduces himself as a Brahmin, well-versed in all sciences, and names amongst others also the science of the ancestral sacrifice. Rama naturally asks the wily demon-king to give him advice. After some artful hesitation Ravana tells him of several animals which are permitted by the sacred books. He mentions as the noblest animal to be slain in honour of a father's spirit the golden-sided deer. But he warns Rama that it is hardly possible to obtain it; for it roams in the forests of the far-off Himalayas, and to kill it is well nigh impossible. The difficulties with which his filial duty is beset act rather as an incentive on Rama; he is ready to start at once to the mountains, and Sita declares that she is willing to go with him. At this moment Ravana causes an apparition of the coveted animal to be seen between the trees of the forest; Rama snatches his bow and arrows, and leaves Sita alone with his arch-enemy.

It is true, Rama is the god-man, the ideal man; but the human element in him is not absent. He loves and suffers as man does; he lets himself be deceived by Ravana; he has to find help for his struggle with the king of the Rakshasas; he is subject to suspicion and jealousy, and a slave of public opinion to such an extent that he compels Sita to undergo the fire-ordeal. These human traits have been used by the dramatist to bring his hero nearer to our understanding.

An entirely different problem is presented by the central figure of "Balacaritram" or "The Exploits of young Krishna." The hero is Krishna, the full incarnation of god Vishnu. He is Narayana himself, who has descended to earth according to the words in the *Bhagavadgita*: "Whenever there is decay of righteousness and there is exaltation of unrighteousness then I incarnate myself; for the protection of the good, for the destruction of evil-doers, to establish righteousness, I am born in all ages." He takes human form, lives with men, shares their amusements, takes pity on their plight; but notwithstanding all this he remains god, and is always conscious of the fact that he is god. His divine nature never merges into humanity. He cannot be deceived by the tricks of the countless demons who come to destroy him; he is always sure of his victory, for he knows that he is the eternal force of Good which the powers of Evil cannot resist. When he appears on earth he fills the world with miracles. He sends forth divine light to show his father Vasudeva the way which leads to salvation. Through his divine power the chains with which Nandagopa has been fettered for many years drop to the ground; he creates a fountain of pure water so that Nandagopa may purify himself; he revives Nandagopa's dead child; all this in the first night of his existence and without uttering a word. When he is only a week old he slays demons. His divine weapons and attributes, his wonderful bird Garuda, all representing his divine powers, descend to earth and live with him.

If Krishna is the personification of Good, the incarnation of Evil is Kamsa, the slayer of children. Just as Vishnu is born in all ages to establish righteousness, so each age brings forth an antagonist, the expression of all that is wicked. Hence the myths of the struggle between Narasimha and Hiranyakasipu, Rama and Ravana, Krishna and Kamsa. Thus the drama "Balacaritram" widens out into a grand mystery of the eternal struggle between Good and Evil. Kamsa, the evil one, is doomed to perish in the same night when Krishna is born. He feels that a force has arisen against which he is powerless. He has terrible visions. Candala women, the lowest of the outcasts, demand that he should marry their daughters. The curse under which he lives, namely that Devaki's son should slay him, appears to him in terrible form to announce that the end is near. The curse gathers the spirits of darkness and drives

Kamsa's Luck out of the palace. The lord of Evil goes so far in his rage as to kill a new-born girl, the daughter of Nandagopa, who had been substituted for the baby Krishna. But out of the child's blood rises in awful grandeur Karttyayani, the goddess of Nemesis. Filling the sky with her terrible form, surrounded by her powerful weapons, she pronounces the death sentence over Kamsa.

The Western parallel to this drama are the mediæval mysteries of Christ and His struggle with Satan. It would not have entered the mind of those mediæval poets to apply to the divine figure of the Saviour the ordinary psychological methods of the dramatist. No more can we expect an Indian author to show us other sides of his divine hero than perfection and omnipotence. It is therefore not surprising that we do not find the intimate psychology of Vasavadatta, Duryodhana, or even Rama. The struggle between Good and Evil that goes on in the soul of man and forms the basis of all dramatic psychology, has been lifted up in "*Balacaritram*" into the realms of metaphysics and religion. The first two Acts give us a grand exposition of the eternal antagonism between the two moral forces that rule our actions.

I have tried to point out and to illustrate with some examples several poetical qualities common to all the dramas which are meanwhile ascribed to Bhasa. These features are dramatic force, depth of psychology and simplicity of expression. In dramatic force he can be compared with Shakespeare or the Greek tragedians; in psychological subtlety he is almost modern; his simplicity of expression puts him distinctly on a different plane than Kalidasa and his followers. It may be that for the first two qualities he has been hailed with great enthusiasm by Western scholars, whereas some Indian scholars whose taste has been trained on the elegance and elaborateness of the "*Kavyas*" seem to take amiss the simplicity of our author's style and deem it unfinished and rather vulgar.

Mr. Ganapati Sastri's discovery has put one more important problem before the historian of Indian literature. The question, who is the author of these dramas and in which period they were written, has not yet been solved. The few attempts hitherto made to come nearer the solution of this interesting problem have been based on a few quotations taken from various sources and belonging to vastly different periods. The same material has led to absolutely contradicting results. This is only natural as quotations generally prove everything and nothing. We might perhaps come a little nearer the solution of our problem by applying the ordinary methods of literary history.

Each drama, or rather each group of dramas, will have to be considered by itself as well as in connection with the remaining ones; thus an attempt should be made to solve the two

main questions—1stly : are the thirteen plays by the same author, or by different authors ? 2ndly : which period, relatively speaking, do they belong to ?

Our first criterion is the style of the dramas. Nobody will deny that there is in Indian literature a marked tendency from simplicity and directness to elegance and elaborateness. It is impossible to date the “*Raghuvansa*” before the “*Ramayana*,” even if we had only stylistic indications to go upon. There also seems to be a tendency from action to description, and from sparsity of words to verbosity. This criterion might be applied when comparing our dramas with dramas of more or less fixed date.

Our second criterion is the relations of our dramas to the existing law-books of poetry—the “*Natyasastram*” of Bharata, the *Dasarupam* and others : these relations should also be compared with those of known dramas. It is typical for Indian poets that they take a pride in following almost slavishly the rules concerning style and language laid down in the canons especially when those books have reached the necessary stage of sanctity by being connected with a mythical seer.

Our third criterion is the numerous historical allusions met with in the dramas. I take the term historical in its widest sense. It comprises not only facts or persons of which we have documentary evidence, but also the general picture of civilisation represented in the play. To give an example : In the “*Pratima-nataka*,” mention is made of life-like monuments put up in honour of deceased kings. This reminds us very much of the famous statue of King Kanishka in Muttra and other royal statues of the Kushana period. Here archaeology will probably be able to help us.

The fourth criterion is the relations of a drama to its possible sources. If we can tell with certainty which source the dramatist has used for his plot, and can fix a period for this source, we shall have something to start with. For instance, let us take the two *Ramayana*-dramas. It seems possible that our dramatist has known only the older or shorter redaction of the epos, which did not include the *Balakandam* and the *Uttarakandam*. If this theory can be proved we shall have a fair starting point.

The fifth criterion is a comparison of our dramas with dramas of known date treating the same subject. The most striking case in this direction is a comedy called “*Carudattam*,” one of the 13 *natakas* of which I have not spoken. It not only treats the same subject as the famous “*Mṛcchakatikam*” ascribed to King Sudraka, but also shows such a number of coincidences that only two conclusions are possible : Either both are of the same author, the one being a first draft of the other ;—in this case the probability is that “*Carudattam*” as the less elaborate is the draft of the “*Toy-cart*.” Or we have to do with a striking

case of plagiarism in which the *prima facie* evidence would be against "Mr̥chakatikam."

I can however in this short study only hint at the interesting discoveries which await the student of Indian literature. What the result of these researches will be it is difficult to say. Whether one author or several will share the distinction of having produced the master-pieces which have been the subject of this lecture we do not yet know. Nor do we know the name of the man who ranks with Kalidasa as India's greatest dramatist. Meanwhile let us be grateful that the darkness of oblivion has given up such a treasure of which the literature of every nation might be proud.

18. Detection of Lactic and Glycolic Acids and a suggestion regarding the Constitution of Morphine.

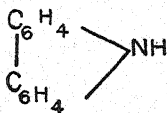
By S. C. CHATTERJI, M.Sc., *Cotton College, Gauhati.*

When acetaldehyde is added to a solution of benzidine (p—p diamino—diphenyl) in concentrated sulphuric acid, the liquid gradually assumes a dark-red colouration. Under identical conditions formaldehyde brings about no perceptible



Benzidine.

change, or at best a slight yellowish colouration. The reaction may serve both as a test for benzidine and for differentiating between the two aldehydes. The fact that acetaldehyde is produced when lactic acid is warmed with concentrated sulphuric acid, enables the reaction to be employed as a test for this substance as well. It may be carried out by shaking up a pinch of benzidine with about 4 cc. and then slowly adding a

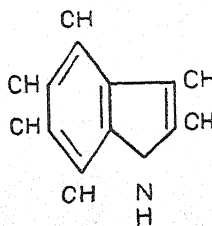


Carbazole.

few drops of the liquid supposed to contain lactic acid. If the mixture be next gently warmed, acetaldehyde will be produced, and the solution will assume a red colouration, its intensity depending, up to a certain point, on the amount of the acid present. Lactic acid may also be detected and distinguished from the similarly constituted glycolic acid by the carbazole-aldehyde reaction. If about 1 gram of carbazole be added

to 3 cc. of concentrated sulphuric acid and the mixture heated for about two minutes with a few drops of lactic acid, preferably in a water-bath, it will assume a yellowish colouration, changing rapidly to yellowish red, and finally to reddish brown. Glycolic acid, on being subjected to a similar treatment, yields an intense blue colouration or greenish blue precipitate depending on the amount of the acid present. The reaction is highly sensitive, and may with advantage be employed for the detection of the acid in sour milk or urine. As in the previous case, the mechanism of the reaction consists, first of all, in the splitting up of the acids into the respective aldehydes, and the latter then bring about the characteristic changes.

The well-known morphine reaction may also be similarly utilised. If carried out as before, lactic acid yields a yellow changing to red or reddish brown, and glycolic acid a deep violet colouration. For considerations stated below it appeared interesting to study the reaction of indole with the two aldehydes. The behaviour of this substance towards formalde-

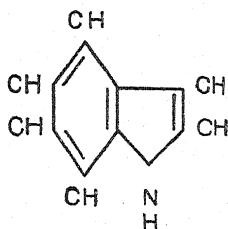


Indole.

hyde and acetaldehyde, and therefore towards glycolic and lactic acids, appears to be similar to that of morphine. The only perceptible difference is in the intensity of the colouration produced with formaldehyde. The difference is thus one of degree and not of kind—the violet tint given by morphine being of a deeper shade than that of indole. In fact but for its comparatively high cost indole might be used as a reagent for the detection of the two aldehydes, as also of lactic and glycolic acids.

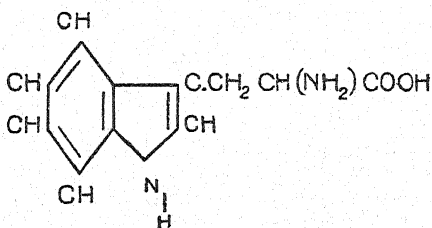
In connection with the morphine-aldehyde reaction it may be mentioned that Rosenheim has observed (*Bio-Chemical Journal*, 1906, i. 233-240) that formaldehyde also produces a similar violet colouration when treated with proteins in the presence of concentrated sulphuric acid. Salmon Acree (*American Chemical Journal*, 1907, 37, 604-619) has repeated Rosenheim's experiments on a large scale, and having applied the test to a large number of substances, has arrived at the general conclusion that the production of a violet colouration with for-

maldehyde and concentrated sulphuric acid is a characteristic test for certain classes of proteins. The reaction in the case of proteins has been explained by Rosenheim as due to the previous formation of a protein-aldehyde compound and its subsequent oxidation. It has been supposed to depend on the presence of the indole or tryptophane group in the molecule. Proteins, like gelatin, in which the tryptophane or indole group is absent cannot by any means be made to respond to this test.



Indole.

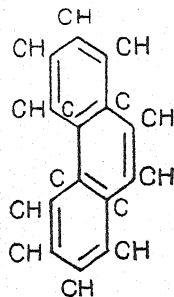
Acree also accepts Rosenheim's view of the mechanism of the reaction. The above facts naturally lead us to the interesting question: Does morphine which produces a violet coloration with formaldehyde, contain an indole group in its molecule? The constitution of morphine which has the empirical formula $C_{17}H_{19}O_5N$ has not up till now been established beyond doubt. That it contains a phenanthrene nucleus in its molecule has been proved by the recent researches of Vongerichten



Tryptophane or Indole-Aminopropionic acid.

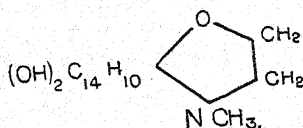
and Schrotter. The large amount of phenanthrene yielded by morphine, when the latter is distilled with zinc dust, goes to support the same fact. It has also been conclusively shown that of the three oxygen atoms two are hydroxylic and of these two again, one phenolic, and the other alcoholic in character. Regarding the nature and position of the third oxygen atom we have very little of positive evidence. It is indifferent and has therefore been assumed to be present as an anhydride group. Morphine is a tertiary base, for on treatment with

methyl iodide in alkaline solution the phenolic hydroxyl is first of all methylated, and then a molecule of methyl-iodide adds itself to the nitrogen atom. The position of the nitrogen atom in the molecule has been the subject of much discussion,



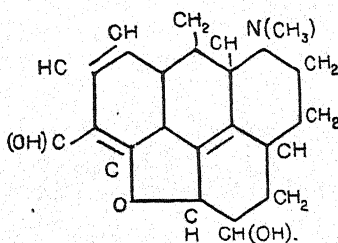
Phenanthrene.

and when this will be fixed with certainty, the morphine problem will probably be finally solved. From time to time various formulæ have been suggested for this substance. Knorr regarded the nitrogen atom as forming part of an oxazine group, attached to the phenanthrene nucleus.



Knorr's formula.

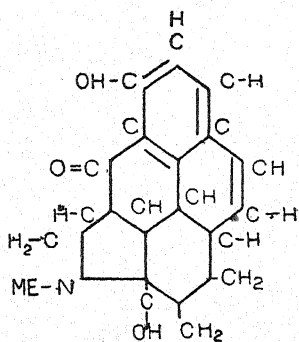
This view has now been abandoned, and the general opinion is in favour of the structure formulated by Pschorr, who regards the nitrogen atom to be present in a reduced pyridine ring. His formula is as follows:—



Pschorr's formula. (Morphine).

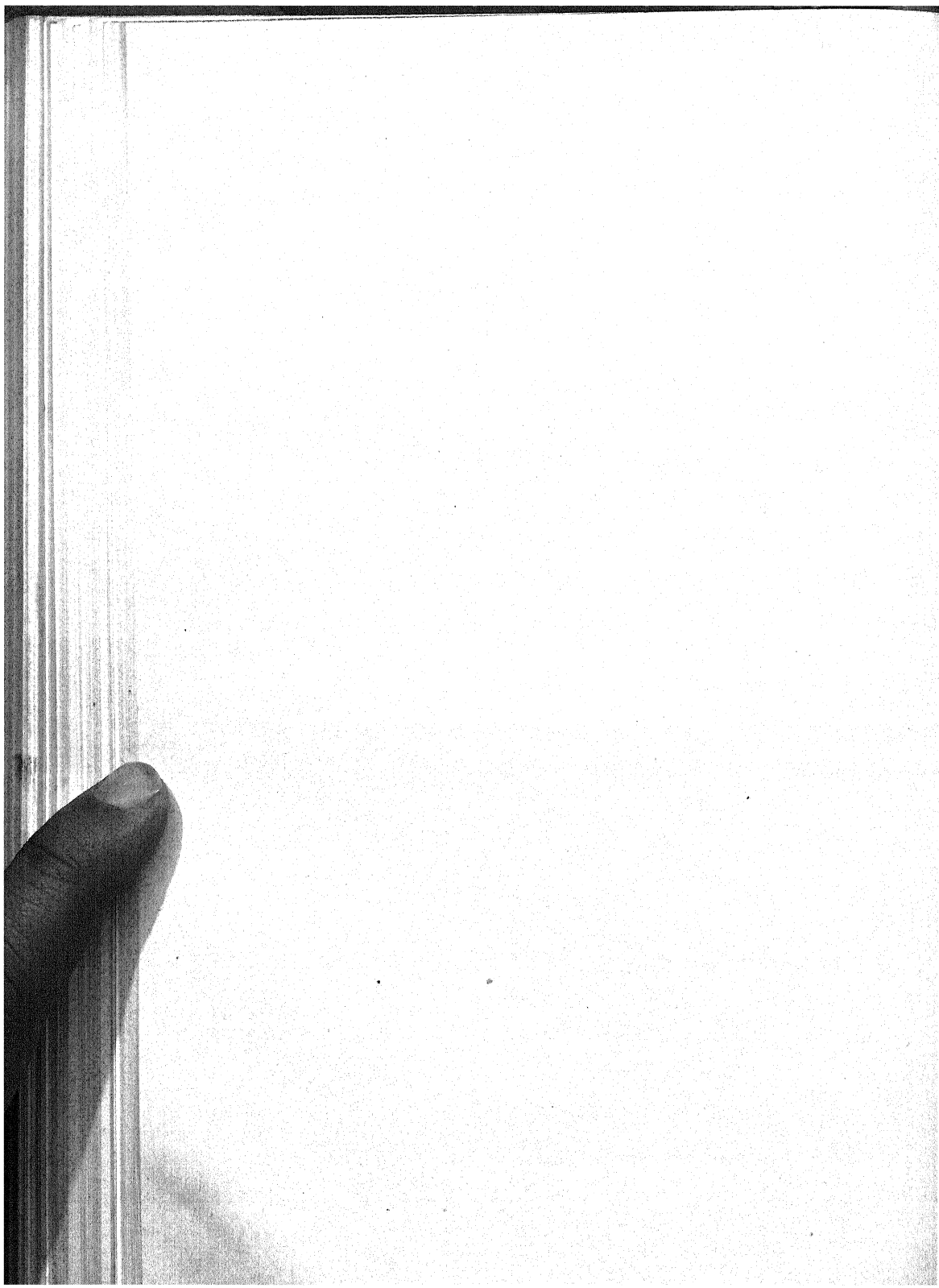
It represents morphine as a dihydroxy-phenanthrene, containing an ether-linked oxygen atom and a hydrogenised pyridine nucleus having the nitrogen linked to methyl. The similarity in the behaviour of proteins containing the indole group and of morphine towards formaldehyde, naturally leads us to the search for a group common to both. The reaction in the case of proteins has, as already stated, been explained by Rosenheim as due to the presence of the indole group. Proteins, in which the indole group is absent, do not respond to this test. The behaviour of indole itself, previously mentioned, lends a strong support to the same view. Like morphine it produces a violet colouration with formaldehyde and reddish brown with acetaldehyde. This leads us to suggest the presence of an indole group in the morphine molecule. That the production of the colour reaction is due to the presence of a particular group in the morphine molecule is also evidenced by the fact that codeine, whose identity as methyl morphine has been established beyond doubt, has been found by Deniges (*Bull. Soc. Chim.* 1909, iv. 647-49) to exhibit the same colour changes with the two Aldehydes.

I therefore venture to suggest that the Nitrogen atom in Morphine forms part of a five-membered ring, and that its formula should be written in such a way as would indicate the presence of an indole group in it. Of the number of formulae which may be drawn up in this way, the following one seems to be the most preferable as being in accord with the maximum number of the other experimental facts hitherto noted:—



Morphine.

Finally it may be mentioned that Hans Th. Bucherer (*J. Pr. Chem.* 1907 [ii] 76, 428-432) as a result of his investigation of the action of sulphites on pyridine and morphine has suggested the same formula for the alkaloid.



19. Observations on Pollination in *Alysicarpus*.

By K. CHERIAN JACOB, L.Ag. (Formerly Post-Graduate Student, Pusa), Agricultural College, Coimbatore.

There are more than half a dozen species of *Alysicarpus* which are very common throughout the plains of India. According to Hooker¹ "Species of *Alysicarpus* are weeds everywhere in the tropics of the old world." They form some of the chief constituents of the pastures of Southern India, and in some places whole areas are covered by these plants, and they can be seen cropping out from among the tufts of grasses. In January last during my tours in Godavari I observed that the flowers of *Alysicarpus* have a strong explosive mechanism. This year, at Coimbatore, I extended my observations on this subject, the results of which I propose to lay before you in this paper.

The Indian species of *Alysicarpus* may be divided into two groups according to their differences in floral structure and modes of pollination. One of these groups is characterised by a large glumaceous calyx divided to the base, as in *A. rugosus*, *A. longifolius*, *A. bupleurifolius* and *A. belgaumensis*. In this group the corolla does not open before the calyx; the calyx opens out by the flexion of its base possibly due to the action of the sun, and closes again when the sun gets less powerful, and either one or both of the geminate flowers are ready for pollination at one time in an inflorescence, so that a single spike may take a long time—sometimes even three weeks—for the complete fertilisation of the whole series.

In the other group the calyx is small and not glumaceous, and possesses a distinct calyx tube and slender calyx teeth as exemplified by *A. vaginalis*, *A. monilifer* and *A. hamosus*. For this reason the corolla can open independently of the calyx. Again a number of flowers, as many as 10 to 12, are simultaneously open on any inflorescence, the fertilisation of which will be completed in three or four days.

The structure of the other parts of the flower is more or less similar in both the groups, and a knowledge of it will help one in understanding the floral mechanism. *A. rugosus*, by reason of its possessing rather large flowers and also of its being a familiar species in the plains, may be taken as our type.

The rose-red corolla has sometimes its standard of an yellowish red colour, but the wings are always bright red

¹ Hooker's *Flora of British India*.

The standard is erect in open flowers and acts as a signboard.¹ It possesses two dark streaks functioning as nectar-guides, converging basally to a pair of thick fleshy swellings. The bright red wings are the resting place for the pollinating insect and they assume the form of a platform, being united with the keel by interlocking folds about their middle, and the union is effected by a projection on the keel fitting closely into a corresponding pit on the wings on either side. In open flowers it is impossible to separate them without tearing the parts, but in very young buds the parts are separable. The wings have folds at their free edges on the staminal column near the base.

The keel has a claw, which by the sun's action bends and exerts a strong downward pressure on the ovary. It has also a fold of its free edge on the staminal column (enclosing the ovary) on either side in front of the fold of the wings. The keel is narrowed near the apex, slightly holding the tip of the staminal column.

The diadelphous stamens, of which the anthers are disposed in two sets, one closely behind the other, are slightly protandrous and the anthers dehisce in the flower before explosion.

The style slightly projects out of the staminal column in order to keep off the stigma from the pollen liberated a little lower down in the keel by the bursting of the anthers.

The flowers being red² and the pollen grains being sticky, *A. rugosus* is evidently pollinated by insects usually belonging to the order Hymenoptera.

Having studied the structure of the flowers we may proceed to examine the process of pollination in nature.

In full sunshine the flowers open and become ready for pollination, and it is at this time that the insect-visitors frequent the plants.

"One must not be annoyed," says the great Sprengel, "at having to spend a long time near a flowering plant, for it is not always visited forthwith by the particular insect which is designed to fertilize it," and I had to wait and watch for three days before I discovered the particular insect which visits *A. rugosus*.

Although several insects, including one or two small butterflies, many black ants, a few small beetles and a bug were found on the plants, a bee, *Nomia oxybeloides*, alone is able to set the flower mechanism in motion, thereby bringing about normal fertilisation. The other insects visit the plants probably to steal nectar and pollen from the exploded flowers. Failing visits from *Nomia oxybeloides*, explosion does not take place. The pollen often gains access

¹ Knuth's Handbook of Flower Pollination, vol. I, page 260.

² Knuth's Handbook of Flower Pollination, vol. I, pages 69 and 196.

to the stigma, but fertilisation does not take place without an explosion caused by the visit of particular insect mentioned.

The flowers appear to be self-sterile, for I selfed 6 flowers and bagged them, but none of them set. It is however evident that these results are by no means conclusive, for self-sterility is a character that is not constant¹ for all individuals of the same species, but varies with the locality and the individuals. The flowers in this species are thus adapted only for cross fertilisation, and probably it is for the purpose of giving the plant enough chances, that one or two flowers only are ready for pollination every day on any inflorescence.

Now let us see how cross fertilisation takes place. In an open flower a state of tension exists between the ovary and the keel, as in *Indigofera*²; and as already mentioned, the keel constitutes a spring which presses the ovary downwards, and is kept in position by means of the various folds of the wings and keel as described above.

It therefore follows that when the insect (*Nomia oxybeloides*) alights on the flower resting with its limbs on the wings, which are interlocked with the keel, and thrusts its head under the standard, the folds of the wings and the keel slip down the staminal column enclosing the ovary. At the same time the keel splits open above from base to tip. When the splitting has extended as far as the end of the style, the stretched parts suddenly separate and the keel with its interlocked wings spring down owing to the bending of the claws above referred to till they are nearly at right angles to the ovary which has jerked suddenly upwards.

The narrowness of the keel just below the apex which holds the staminal column slightly inwards, and the cupular tip of the keel which holds the staminal tip slightly downwards, are responsible for the strong jerk given to the tip of the already jerked staminal column. The pollen is thereby thrown upwards and deposited on the ventral surface of the insect with great force. At the same time the slightly projecting stigma comes into contact with the ventral surface of the insect, which is covered with foreign pollen, if the insect happens to have previously visited another flower of the same species. In this way the stigma is *cross-pollinated*. Since the throwing of the pollen precedes the touching of the stigma, or occurs simultaneously, there is a fear of the pollen of the same flower being deposited on the stigma, and in such cases the foreign pollen always predominates.³

Before proceeding further I may here relate a few other observations connected with the pollination in *A. rugosus*.

¹ Knuth's Handbook of Flower Pollination, vol. I, page 196.

² "The Improvement of Indigo", Howards.

³ Knuth's Pollination, vol. I, page 36.

Nomia oxybeloides visits flowers chiefly for gathering pollen, and if the whole of the pollen from a flower could be gathered by the bee in one visit, its needs will have been satisfied when a few flowers have been visited. In nature, however, the flower throws out the greater part of the pollen when visited by the bee, and the insect can gather only the few pollen grains that may still be left on the exploded stamens. The bee has therefore of necessity to visit a very large number of flowers, before it can get a sufficiently full load.

When the flower explodes, the bright red wings, which form the most conspicuous part of the flower, are carried away by the interlocked keel to a different position and makes it very inconspicuous; and in its place the pale staminal column is made to appear. This helps the insect to go straight to unexploded flowers. The arrangement saves the time of the busy insects, and is a case of distinct help rendered by the plant to its insect-visitor.

When *Nomia oxybeloides* visits flowers, it usually visits only one or two flowers in one individual plant, and passes on to some other, even if there happen to be many unexploded flowers on it; and may visit it again a second or a third time. This may appear to an observer a rather strange behaviour; but we know that it is just what the plant requires, *Xenogamy* being thereby brought about and *Geitonogamy* prevented.

Now we will pass on to the very interesting plant *A. vaginalis*, which belongs to the second group above referred to. The floral mechanism agrees in all its details with the last species, *A. rugosus*, except in some of the points mentioned already.

This trailing plant has a gregarious habit and also branches copiously; so much so that it completely covers the ground wherever it is found growing. The branches of neighbouring plants get intricately interlaced, and in one case on an examination of a circular patch of ground 7 inches in diameter, I was able to trace branches of 9 separate plants. Each branch had a number of flowering branches. Three separate countings of inflorescences in one square foot of ground gave me an average of about 90 inflorescences, and one inflorescence therefore occupies only 1.6 square inches of ground on an average. But, in nature, the great majority either touch or cross one another.

As the pollination work has to be hurried through a large number of open flowers, I thought I could find out the insect-visitor of this plant very easily; but I was quite disappointed. Although numbers of exploded flowers could be noticed, I could not find out the insect, that must have visited the flowers and caused them to explode. I was very much annoyed at my failure in my attempts at detecting the insect, and with the resolve of finally tracking down the insect that had been dodging me, I directed my attention to one particular inflorescence; and

that with surprising results. I discovered that in this plant the flower explodes without any insect visit or the application of any external force. An observer may easily see, if he watches one particular inflorescence between 12 noon and 1 p.m., that as the result of every explosion, a cloud of pollen grains is thrown upwards and they may rise to a height of one to one and a half inches above the exploded flower and then shower down on the stigmas of the neighbouring inflorescences which, as I showed you, are in most cases within the radius of an inch or a little more from the exploded inflorescence.

In some cases, the pollen from the numerous flowers of an inflorescence may be drifted back to the stigmas of the same flowers. Since such stigmas have an equal chance of getting pollen from the neighbouring plant, the foreign pollen¹ predominates, and *Xenogamy* is effected.

Now, one might ask what would happen if only one plant is grown in one particular place. The answer is that such is not the case in nature, and in such an exceptional case, there being many open flowers on one inflorescence, pollen could be carried either from one flower to another or from one branch to another branch. Here *Geitonogamy* is effected, which is *more advantageous* than self-pollination.

By examining side by side the flowers of *A. rugosus* and *A. vaginalis* one could see that in the former the flowers are brighter and the nectary is swollen out and contains nectar; but in the latter it is less coloured and the nectary is almost functionless. In both, however, the pollen is sticky. So this might have been primarily intended for some specialised insect like *Nomia*; but since insects which are necessary to carry out this elaborate work perhaps are not in sufficient numbers, the plant has to resort to this sort of carrying out *cross-pollination without any external agency*.

It would be interesting to know the reason why the flowers of *A. vaginalis* explode freely without any external force, while those of *A. rugosus*, having an almost similar explosive mechanism are at the mercy of the insects. Regarding this point I subjected flowers of these plants to varying temperatures and some interesting observations have been made which I hope to continue.

It appears from the preceding account that all plants do not depend entirely on an external agency for cross-pollination.

Since writing the above I have found the *A. vaginalis* type of pollination—by spontaneous explosion—in *A. monilifer*. This is interesting because the latter falls under my *A. vaginalis* group, and the mechanism is exactly the one I should expect.

¹ Handbook of Flower Pollination, vol. I, page 38.

SUMMARY.

1. The flowers of the whole genus of *Alysicarpus* have a strong explosive mechanism, which is set in action by the sudden bending of the claws of the keel by the sun's action.

2. In *A. rugosus*—one of the species with a glumaceous calyx—no explosion takes place without a visit from a particular insect.

3. The particular insect-visitor for this species is *Nomia oxybeloides*.

4. Unexploded flowers do not set fruits, though often a few grains of pollen are seen attached to the stigma.

5. *Nomia*, on which *A. rugosus* entirely depends for fertilisation, are not found in sufficiently large numbers, and this evidently accounts for the plant putting forth one or two flowers only daily so as to ensure the certainty of a good proportion of them setting fruits.

6. The narrowness below the apex and the cupular tip of the keel are responsible for the pollen being thrown upwards with force.

7. Since the pollen is strewn about, the insect is made to visit a large number of flowers, before it could get a good load of pollen.

8. The wings being interlocked with the keel, the flowers become quite inconspicuous soon after explosion, and it is a help rendered by the plant to the insect to make the best use of its time.

9. *Nomia oxybeloides* visits at one time only one or two flowers in one plant, though many of them may be open. Thus *Geitonogamy* is prevented and *Xenogamy* ensured.

10. In *A. vaginalis*, with a small calyx, explosion takes place spontaneously without any insect-visit or any external force.

11. Since the interlacing branches of many plants are seen very near one another and the inflorescences are seen so close that each one hardly gets an area of 1·6 square inches on an average, and since the flowers by explosion could throw the pollen to a distance of an inch, or an inch and a half, *Xenogamy* is brought about without external agencies.

20. On the Occurrence of Limburgite in British Baluchistan.

By HEM CHANDRA DAS-GUPTA, M.A., F.G.S.

In the year 1907 I had an opportunity of visiting parts of British Baluchistan in charge of a party of students from the Presidency College, Calcutta. The palaeontological collections obtained during the tour have already been described,¹ and in the present note I propose to give an account of the trap rock obtained in the neighbourhood of Hamandun (lat. 30°28'N., long. 67°24'E.).

The first mention of the occurrence of Deccan trap in Baluchistan was made by Mr. Oldham who has described the occurrence of "ash beds and even basaltic trap apparently interbedded with the uppermost beds of the Dunghan group in the Bolan Pass."² A geological map of the area has been published by Mr. Vredenburg³ and it appears that the following sequence has been recognized:—

Intrusive gabbros and serpentines, frequently chrome-bearing.	} Senonian.
Dunghan group.	
Bedded agglomerates and basalts of Hamandun (Deccan trap).	

The rock to be described in this short note was obtained from the lowest member of the Senonian group just referred to.

From the considerations given below it will appear that the rock under description belongs to the class of *magma-basalts* (Bořický), i.e., it is an ultra-basic lava flow and allied to the limburgites of Rosenbusch. Limburgite is a rock of rather rare occurrence in India. For the first mention of this rock within India we are indebted to Sir Thomas Holland.⁴ Mr. Vredenburg has described limburgite from the Baluchistan desert,⁵ while Mr. Adye has also noticed the same rock in the Deccan trap of Kathiawar.⁶ As far as my information goes, the Kathiawar finds are the only recorded examples of ultra-basic nature of the Deccan trap. They have not, however, been studied

¹ Journ. As. Soc. Bengal, Vol. VII, pp. 1-3 (1911).

² Geology of India (2nd edition), p. 291.

³ Rec. Geol. Surv. Ind., Vol. XXXI, pl. 18 (1904).

⁴ This rock to which attention was drawn by Mr. Middlemiss occurs near Palakod (Salem) and is an *enstatite-limburgite*. (Rec. Geol. Surv. Ind., Vol. XXX, p. 19, footnote).

⁵ Mem. Geol. Surv. Ind., Vol. XXXI, p. 265.

⁶ Economic Geology of Navanagar State, pp. 92, 94-95, 97.

in detail, and I think that a record of the results of my study of the Hamandun limburgites will not be out of place.

The rock is compact and dark-grayish black in colour, with a specific gravity of 2.94.¹ The rock weathers superficially into a whitish lithomargic substance, while the removal of the lithomarge very often gives rise to a pitted appearance on the surface, the unweathered black part often standing out in relief. The lithomarge sometimes shows a reddish tinge. The porphyritic structure of the rock is very well seen even in hand specimens, and a few good crystals of augite were isolated. One of them was carefully examined and the faces *e*, *m*", *a* and *m* were determined. One isolated small crystal, when treated with hydrogen peroxide, turned slightly yellow, showing the presence of titanium.

Thin sections of the rock, when examined under the microscope, show its porphyritic structure. The phenocrysts found are titaniferous augite and olivine, and both of them have been changed to serpentine. The augite is pale-violet in colour with a very faint pleochroism, often twinned and showing a zonal structure. Serpentinisation is fairly marked, though, as one may expect, it is not so complete as in the case of olivine. Some iron ores are also present, evidently due to the breaking up of the ferro-magnesian silicates. The groundmass is hypocrystalline² consisting of microlites of lath-shaped feldspars and of augite, in second generation, with an amount of residual glass. The glassy portion of the groundmass is of brown colour with yellow spots and patches due to the formation of serpentine. This serpentine is possibly derived from the alteration of some of the augite microlites in the groundmass, and it is extremely difficult to decide whether olivine was present in the groundmass or not—the whole of the olivine having in the former case been replaced by serpentine.

A study of thin sections shows two peculiarities of the rock, viz., (i) the smaller amount of the phenocrysts of olivine while compared with those of augite and (ii) the presence of feldspar microlites in the groundmass. As regards the relative proportion between olivine and augite, phenocrysts, it may be mentioned that a somewhat parallel case was observed by Dr. Hatch from Madagascar,³ while attention will be drawn to the second peculiarity later on.

A chemical examination of this rock was kindly undertaken by Mr. Prabodha Chandra Chatterjee, M.A., F.C.S., of the Bengal Chemical and Pharmaceutical Works. This analysis shows conclusively the ultra-basic nature of the Hamandun

¹ This is the average of four determinations by Babu Bijoy Gopal Sen, B.Sc.

² Harker: *Petrology for Students* (4th edition), p. 208.

³ Q.J.G.S., Vol. XLV. pp. 352-5 (1889).

lava, while the presence of olivine and of augite as phenocrysts points out its limburgitic character. The number of the complete analyses of limburgite available for study and comparison is rather small, and these show that there is a considerable variation in the composition of the different examples of limburgite, the percentage of SiO_2 lying between 46.76¹ and 38.34.² The Hamandun specimen is exceptionally rich in Al_2O_3 , fairly rich in CaO , and may be compared with the limburgites the analysis of which as also that of the Baluchistan specimen are given below:—

	I	II	III	IV
SiO_2	.. 40.73	40.70	39.32	38.62
TiO_2	.. 0.71	1.55	....	1.86
Al_2O_3	.. 20.62	14.89	17.53	13.90
Fe_2O_3	.. 5.52	7.05	3.07	5.97
FeO	.. 5.13	6.81	9.12	8.65
MnO}	.. ....	....	....	0.30
CaO	.. 12.50	12.21	10.38	15.54
MgO	.. 8.75	9.92	8.00	11.21
K_2O	.. 0.90	1.17	2.04	0.57
Na_2O	.. 3.03	2.78	2.44	2.01
H_2O	.. 1.41	1.39	7.30	1.46
P_2O_5	.. ....	0.76	....	0.60
	99.30	99.23	99.20	100.69

- I. Limburgite from Hamandun. Analyst P. C. Chatterjee.
- II. Limburgite from Nonnenwald b. Lauban, Lausitz. (Osann: Beitr. Zur chem. Petrographie. II, Teil p. 242).
- III. Limburgite from Bendigo (Victoria) (Proc. Roy. Soc., Victoria n.s. Vol. XXIV, p. 133).
- IV. Limburgite from Dakar Peak, Cape Verde Islands. (Prof. pap. no. 14, U.S. Geol. Surv., p. 347).

It is a matter of regret that very little has hitherto been done regarding the systematic analysis of the Indian igneous rocks, and thus with the exception of a few cases mentioned by Washington,³ Dr. Walker,⁴ and the data recorded by Dr. Fermor⁵ in course of a discussion of the position of his Kodurite

¹ Min. u. Petr. Mittheil., Bd. XVII, p. 534 (1898).

² Min. u. Petr. Mittheil., Bd. XX, p. 304 (1901).

³ Prof. paper No. 14, U.S. Geol. Surv., pp. 125, 247, 355.

⁴ Rec. Geol. Surv. Ind., Vol. XXXVI, pp. 19-22.

⁵ Rec. Geol. Surv. Ind., Vol. XLII, pp. 208-230. The igneous nature of the Kodurite series of rocks is not, however, beyond doubt as in a more recent communication Dr. Fermor expressed the opinion that 'the Kodurite series may perchance be an example of hybridism on a large scale, in which..... a granitic intrusive of some magnitude has bodily

series in the quantitative chemico-mineralogical classification of the American petrographers,¹ nothing has been done to fit any Indian rock into this classificatory scheme. From the molecular ratios of the different constituents of the Hamandun rock the following norm has been calculated :—

Orthoclase	..	..	..	5.56
Anorthite	..	..	..	39.75
Nepheline	..	..	..	13.92
Diopside	..	..	..	15.58
Olivine	..	..	..	12.89
Akermanite	..	..	..	0.86
Magnetite	..	..	..	7.89
Ilmenite	..	..	..	1.37
				<hr/>
H ₂ O	..	..	..	97.82
				1.41
				<hr/>
				99.23
				<hr/>

From the norm given above the position of the rock has been determined as follows :—

Class III Salfemane—Salfemic.
 Order 6 Portugare—Lendofelic.
 Rang 4 Hamandunase²—docalcic.
 Subrang 4 Hamandunose—presodic.
 Grad 2 Hamandunate—dopolic.
 Subgrad 1 Hamandunote—permirlic.
 Section 1 premiric.
 Subsection 1 premagnesianic.

A question has recently arisen about the true nature of limburgite. As originally defined by Rosenbusch the rock is supposed to be free from felspar.³ It was Prof. Bonney who

assimilated entire manganese-ore deposits' (Rec. Geol. Surv. Ind., Vol. XLV, p. 103).

¹ Quantitative Classification of Igneous Rocks by Cross, Iddings, Pirsson and Washington; Prof. paper No. 28, U.S. Geol. Surv. 1904; Journ. Geol., Vol. 20, pp. 550-561, 1912.

² The authors of this scheme had originally a threefold division for *docalcic* rang (Quant. Class. Ign. rocks, p. 137). This arrangement was subsequently modified by them (Prof. pap. No. 28, U.S. Geol. Surv., p. 14), and thus we find the use of the symbol III. 6. 4. 4-5 (Iddings: Igneous rocks, Vol. II, p. 291). Lacroix proposed the name *Papenoose* for III. 6. 4. 3 (4) (C.R. Acad. Sci. Paris, Vol. 151, p. 124, 1910, and Journ. Geol., Vol. 20, p. 551, 1912). From this it follows that the corresponding rang name should be *Papenoose*. But evidently there was some mistake in the calculation as the rock (essexitic gabbro from Tahiti) for which the above name was proposed has subsequently been found out to belong to IV. 2. 2, 2 (Iddings: Igneous rocks, Vol. II, p. 653). Accordingly a new name has been suggested by me.

³ Elemente der Gesteinslehre, p. 361. In the latest edition of 'Mikros-

first of all pointed out clearly the occurrence of lath-shaped crystals of feldspars in the groundmass of the rock, and accordingly the original definition of the rock cannot be accepted now.¹ Specimens from Limbourg hill were examined, feldspar was found in the groundmass and 'feldspar is abundant in much of the rock at both ends of the hill, of which the original limburgite, with the base of brown glass, is only a local condition.'² Among the limburgites that have been described as yet, those from Kathiawar by Mr. Adye,³ from the Macedon area by Dr. Skeats and Mr. Summers,⁴ from Balwyn (near Doncaster) by Messrs. Chapman and Thiele,⁵ from Southern India by Sir Thomas Holland,⁶ from a few places in Bohemia by Hinterlechner,⁷ from the Black Mountain by Soellner,⁸ from Sao Thome and Fernando Po by Boese,⁹ all show microlites of feldspar in the groundmass. While describing the geology of Costa Rica, Mr. Romanes has mentioned the occurrence of a limburgite 'entirely free from feldspar,' but at the same time it has been observed that the groundmass has undergone very considerable alteration and become completely devitrified. Dr. Bonney, on a careful examination of this rock, has shown the great 'resemblance which the groundmass bears to the mineral *pseudophite* described by both Dr. Teall and the late J. D. Dana as forming a special alteration product of feldspar. The residual glass had, therefore, probably the composition of feldspar or may even have largely consisted of minute feldspar-crystals.'¹⁰

It must also be stated, however, that from several localities

copische Physiographie der Massigen Gesteine' (1908) Rosenbusch seemed to have changed his original definition, as we find 'die Limburgite und Augitite sind gemeinschaftlich dadurch charakterisiert, dass sie weder Feldspat noch ein feldspathähnliches Mineral als wesentlichen Gemengteil enthalten' (p. 1463).

¹ Geol. Mag. Dec. IV., Vol. VIII, pp. 411-417, 1901.

² Ibid., p. 416.

³ Economic Geology of Navanagar State, pp. 93, 95, 97.

⁴ Among the seven types of limburgite described from this area four contain feldspars in the groundmass. (Bull. Geol. Surv. Victoria, No. 24, p. 27, 1912).

⁵ Proc. Roy. Soc. Vict., N.S. XXIV, p. 126, 1912.

⁶ Rec. Geol. Surv. Ind., Vol. XXX, p. 19 footnote.

⁷ Jahrb. K.K. Geol. Reichnst., Vol. L, 1900, pp. 504, 514.

⁸ Jahrb. K.K. Preuss., Geol. Landsanst., Bd. XXII, p. 56, 1904.

⁹ According to Boese in the groundmass of the São Thomé limburgite 'Feldspat kommt äusserst selten vor, seine Menge beträgt noch nicht einmal 1%.' While describing the limburgites from Fernando Po the same author has observed that 'in der Abteilung der Limburgite mögen zuerst einige Gesteine als *limburgitische Basalte* beschrieben werden, die zwischen den Basalten und Limburgiten stehen, weil sie Plagioklas in geringer Menge führen' (N. Jahrb. f. Min. Geol. u. Pal. Beilage-Band. XXXIV, pp. 275, 307, 1912). Terms like Limburgbasalt, Limburg-tachylite were also suggested by Prof. Bonney (op. cit., p. 417).

¹⁰ Q.J.G.S., Vol. LXVIII, pp. 129-130, 1912. While describing the limburgite of the Cripple Creek district, Mr. Stevens says that the groundmass is 'composed of fine augite crystals, set in a clear, colourless, isotropic

limburgite has been described, the groundmass of which does not contain any felspar. But if we remember the mistake originally committed by Rosenbusch in examining an extreme variety and taking that as the type, the occurrences which are now known to be devoid of felspars require further investigation. From what has been said before it might appear that Boese had solved the question by dividing the limburgites into (a) limburgitic Basalts and (b) Limburgit, i.e. limburgite proper. But while describing the division (b) the author says that 'die Grundmasse ist lediglich aus Augit und Magnetit zusammengesetzt. Plagioklas fehlt entweder gänzlich oder ist doch nur in äusserst geringen Mengen vorhanden. Er scheint Labrador Andesin oder saurer zu sein.'¹ Thus it appears that the question about the true nature of the limburgites still remains open, and we may provisionally look upon them connected, not with the peridotites, but, as suggested by Prof. Bonney,² with the picrites on the one hand and with the olivine dolerites on the other, and from what has been stated above I think that it may also be said that a very large section of the rocks now known as limburgites is very closely allied to the picrites.³

base, either glass or analcite' (Trans. Am. Inst. Min. Eng., Vol. XXX, p. 763, 1900).

¹ Op. cit., p. 310.

² Op. cit., p. 417.

³ It appears that Rosenbusch himself was doubtful if all the rocks known as limburgite and augitite really belong to the same class, for we read 'die effusiven Äquivalente der alkalischen Peridotite und Pyroxenite; dahin gehören die neovulkanischen Limburgite und Augitite, jedenfalls zum grössten Teil, wenn nicht insgesamt.' (Mikrosk. Phys. d. Massig. Gest. p. 726).

21. Notes on some South Indian Cecidomyiids causing galls in grasses.

By Y. RAMACHANDRA RAO, M.A., F.E.S.

[With Plate X.]

Paddy is subject to a peculiar disease known in the Tamil tracts as "Anaikombu" (Elephant-tusk) or "Thandeethu" (the bearing of earless stalks), in the Telugu districts as "Kodu" and "Koyyala Tegulu" (stick disease), as "Kané" in Canarese (S. Canara District), and in popular English as "silver-shoots". This malady is characterized by the formation in the young plant of a long hollow shoot, carrying, when fresh, a rudimentary leaf at the tip. This out-growth is formed at the expense of the normal development of the bud culminating in the formation of the ear-head, and is, therefore, a distinct source of loss to the ryot. Till about two years ago, the silver-shoot on paddy was a puzzle and was either ascribed to the action of fungi or bacteria, or attributed to that ultimate refuge of a scientist in despair—a constitutional disease. It was only in 1914 when good specimens were received from Pudukottah from one of the ex-students of the Agricultural College, Coimbatore, that the real nature of the disease became apparent.

The silver-shoot is in fact a gall caused by a gall-insect. A small reddish fly belonging to the Family Cecidomyiidae—identified as *Pachydiplosis oryzae* by Dr. E. P. Felt of the New York State Museum, Albany—is the specific cause of the malformation. This fly lays elongate-oval reddish eggs measuring half a millimetre in length on the hairs of the ligules, or on the lower surface of the basal parts of leaves, and rarely, also, on their upper surface, especially in young tillers. The tiny young larvae creep down between the leaf-sheaths till they reach the growing point of the apical or the side buds. On entering the interior of the buds, they seem to lacerate their tender tissues and feed on their nutritious juices. Whether by actual feeding or by continual irritation, an oval chamber is formed around the maggot in the tissues of the growing point. Further normal apical growth being stopped, all the nutrition is directed to the walls of this chamber, which elongates like a normal internode. By the time the out-growth begins to be visible, the maggot will generally have turned into a pupa and in about six days will be ready to emerge as a fly. When about to transform, the pupa, with the help of the dorsal spines of its abdominal segments, wriggles up

the hollow tube, and, boring a hole at the tip with its frontal spines, partially projects out. The adult now emerges, and flies away, leaving the empty pupal skin at the tip of the hollow shoots. This disease is found in paddy generally only in the rainy season and is altogether rare in the dry season crop. As, even in places where paddy is not raised in the dry season, the fly re-appears on paddy with the advent of the rains, it is evident it cannot depend solely on paddy and must have an alternate food-plant, presumably some perennial wild grass, wherein it tides over the dry weather. With the object of finding out such host-plants a scrutinizing search was made among the various grasses in the wet land area of the Central Farm and was attended with rather remarkable results. Never was the paradox that "a man may keep his eyes wide open and yet not see" more truly illustrated. *Panicum fluitans* is a very common grass in the wet land area at Coimbatore, growing abundantly on the field bunds and along the banks of channels. Throughout the year, except in February and March, a gall-midge breeds in this grass causing gall-formations in profusion, 20 to 30 galls sometimes having been found to occur on one single plant. Yet this common grass did not draw my notice, till by chance one day I tumbled on it in the course of my search for the egg-masses of *Oryza velox*. Again, no grass is more familiarly known or more abundant than *Cynodon dactylon*,—"Hariali". This is also attacked by a Cecidomyiid fly which affects the tips of shoots and causes the formation of a body of the shape of a miniature pine-apple. This object is in reality a collective gall from which later on 3 to 8 and sometimes 12 or more hollow shoots appear, each giving rise to a fly. These conspicuous objects were not taken notice of, and, if at all they were, they were believed to be caused by fungi.

These are instances of how one is apt to overlook very obvious things and one may well imagine Nature crying out in extreme pity—like Aunt Betsey Trotwood, in "David Copperfield"—"Blind, Blind, Blind".

At Coimbatore, after very careful search, three grasses were, in the first instance, found to exhibit such formations. They were :—

- (1) *Panicum fluitans*,
- (2) *Cynodon dactylon*.
- (3) *Ischaemum ciliare*.

Quite recently, in November 1916, these formations were noted also in the following three grasses at Coimbatore, viz. :—

- (4) *Andropogon schoenanthus*,
- (5) " " *pertusus*,
- (6) *Apluda varia*.

When galls were first noted on some of these grasses, in the excitement of the discovery, I had the temerity to congratu-

late myself on having found out the host-plants of the paddy gall-fly, but on comparing freshly-bred specimens of all these gall-flies side by side, I was forced to the conclusion that I had to do with several different species altogether, each confining itself to its own particular food-plant. Many of these gall-flies have been sent to Professor E. P. Felt for accurate determination.

Between July and October 1916, I had opportunities of visiting the Government Farm at Palur, S. Arcot District, several places in the Bellary and Kurnool districts, and Samalkota and Anakapalle in the Northern Circars. As leisure and opportunities allowed, I continued my search for gall formations among the wild grasses in these various localities. The results were rather surprising. Instead of the formation of the "silver-shoot" on paddy being an isolated and extraordinary phenomenon, it became evident that it was one of common occurrence in many grasses.

The following grasses were noted to be subject to the attack of gall-flies. As the time needed for collecting them in sufficient quantities was not at my disposal, and breeding appliances were not at hand, the gall-midges could not be reared out in all cases. Again, the degree of parasitisation of the galls was so high that the chances of rearing the flies were considerably minimized. It would be very interesting, if future workers in this line would try and breed out the flies from each grass and have their identity established.

1. *Panicum fluitans*, Retz.—This grass is semi-aquatic and is found growing on field bunds in wet lands, on the banks of canals, in the beds of streams and in shallow tanks. It has so far been noted by me only in Coimbatore and Bellary Districts and in Bangalore. Galls have been found on this grass at Coimbatore and in the following places in the Bellary District, viz. Hadagalli, Kottur, Siruguppa and Yemmiganoor. The flies reared at Coimbatore and in the Bellary District were identical.

The life-history of this fly¹ has been fully studied by me. The female scatters its 300 to 350 eggs singly along the pronounced grooves of the upper surface of the leaves. The eggs are elongate-oval, half a millimetre long, and slightly reddish in colour. They hatch in about three days into tiny active maggots, which crawl by instinct down the leaf and, insinuating themselves between the leaf-sheath and the stem, creep down until they reach the growing tips of either the apical or the side buds. Each bud is occupied only by a single maggot. The shoot begins to show a swelling in about a week or two and the

¹ Through the courtesy of the Ag. Government Entomologist, Coimbatore, information has been received that this fly has been identified by Prof. Felt as *Dyodiplosis* (*Pseudhormomyia*) *fluvialis*, n. sp.

typical hollow shoot emerges in two or three weeks. Though hatching at one time out of the same batch of eggs, the maggots that enter the apical buds complete their development more quickly (at least a week earlier) than those affecting the axillary ones; and invariably the apical galls are much larger in size than the axillary ones. The full-grown maggot is of pale brown colour and possesses a well-marked breast-plate, the anterior ends of which are prolonged into two pointed horns. The freshly formed pupa is milk-white, but later turns bright-pink. The adult emerges in six days. The female is pale brown and possesses a huge reddish abdomen bulged with eggs, while the male is somewhat darker and more slender in form. Most of the eggs are laid during the first night. The male flies seem to go for a drink, soon after emergence, while the females do not display any such thirst.

2. *Panicum punctatum*.—A grass very nearly allied to *P. fluitans* but more thoroughly aquatic. It was collected by me at Samalkota, Godavari District, and showed profuse gall formations. The fly reared out was identical with *Dyodiplosis fluvi-alis*, reared from *P. fluitans*. The flies reared from galls of *P. punctatum* freely laid eggs on *P. fluitans* at Coimbatore. The maggots that hatched out induced typical gall-formations in *P. fluitans* and flies emerged normally from them.

3. *Cynodon dactylon*.—As already noted, a collective gall is formed in this grass, from which 2 to 12 hollow shoots may emerge. Such galls were noted on this grass at Coimbatore, Palur (S. Arcot District), Samalkota (Godavari District), and Anakapalle (Vizagapatam District). The fly which has been identified as *Orseolia Cynodontis*, Kief and Mass. is smaller, comparatively more thick-set and darker than *Dyodiplosis fluvi-alis*. The life-history of this fly has also been studied by me. The eggs are elongate, reddish and about one-third of a millimetre long and are laid in batches of 3 to 20 along the under (and rarely also on the upper) surface of the top leaves of a shoot. The maggots hatch out in three days and, creeping between the leaf-sheaths, reach the rudiments of the apical and axillary buds of the shoot. Owing to the irritation caused by the maggots, several of the side-buds of the shoot begin to develop their galls simultaneously, so that the tip of the shoot bulges out gradually and assumes the pine-apple form. When mature, the hollow shoots appear at the tip and the flies emerge later on. The time taken by the fly to develop into the adult from the egg is about three to six weeks.

4. *Ischaemum ciliare*.—This is also a common grass at Coimbatore in the wet lands. The galls found on this grass are smaller and shorter than those on *P. fluitans* and are developed usually from the axillary buds towards the base of the plant. Flies have been reared and are quite distinct; the wings being more distinctly smoky and the body much darker

than in the other species of Coimbatore. It has been named by Prof. Felt as *Dyodiplosis* (*Pseudhormomyia*) *cornea*, n. sp.

Similar galls were also noted at Samalkota in an allied grass (?).

5. *Panicum stagninum*—an aquatic plant common at Samalkota and Coimbatore along canals, in shallow tanks and along water channels in the wet lands. At Samalkota, in October 1916, silver-shoots were noted in profusion on this grass. Large quantities of this grass were collected and taken to Coimbatore for rearing, but as the galls were heavily parasitised, only small numbers of flies could be reared out. These flies resembled *Pachydiplosis oryzae* in almost all characters, and have been forwarded to Professor Felt for exact identification.¹ As sufficiently large numbers of flies could not be reared out, actual breeding experiments to find whether flies from *P. stagninum* would breed on paddy could not be undertaken and their identity could not, therefore, be solved in a direct manner.

At Samalkota the eggs of this fly were found laid as in paddy, either on the hairs of the rudimentary ligules, or on the leaves or leaf-stalks in the neighbourhood of the ligular region. The silver-shoots were also similarly very long. Though abundant at Coimbatore, this grass has not shown any gall formations there.

6. *Paspalum scrobiculatum* (wild variety)—known in Telugu as Neeti-Arika—is semi-aquatic and is found on bunds in paddy fields and along canal banks. At Samalkota, this grass exhibited long silver-shoots, but as the parasitisation was severe flies could not be reared out. At Coimbatore and in the Bellary District this grass did not exhibit galls.

7. *Andropogon annulatus*.—This grass is very common along roads in black soils in the Bellary District; being perennial, it forms fairly large clumps. On close examination a good many of the clumps showed, in September 1916, long and slender galls among the fresh shoots emerging from the root-stock. Four specimens of the flies² were reared from these galls. Similar formations were noted also at Samalkota on this grass.

8. *Andropogon schoenanthus*.—At Pattikonda, Kurnool District, old but genuine galls were noted on side-shoots high up on the stems of this grass. In November 1916, numerous examples of gall formations in this grass were noted at Coimbatore. It is usually found growing abundantly among prickly pear bushes and in open pasture ground. The galls may appear high up on the plant in the side-shoots or may emerge directly from the root-stock. Flies have been reared. The female fly

¹ The flies have been found identical with *Pachydiplosis oryzae* from paddy by Prof. Felt.

² The flies have been named by Prof. Felt as *Dyodiplosis andropogonis*, n. sp.

is comparatively large in size and pale pinkish-brown in colour.

9. *Andropogon pertusus*.—This grass is extremely common in the pasture grounds of the Central Farm, Coimbatore. On careful examination, small-sized galls were found in small numbers on these plants. The fly, which has been reared out, resembles the gall-fly on *Andropogon schoenanthus* in general appearance, but is smaller in size.

10. *Apluda varia*.—This is a slender red-stemmed, tall-growing grass commonly found among prickly pear bushes and along the banks of water-courses and canals. Galls were first noted in this grass at Samalkota in October 1916, but flies could not be reared. In November, galls were found abundantly on this grass at Coimbatore. They are slender, elongate structures of violet-brown colour and generally covered with a whitish bloom. The tip is surmounted usually by an undeveloped leaf. In some cases flower buds in the ear-heads were found transformed into galls. The fly is slightly smaller, slenderer and darker than the one reared from *A. schoenanthus*. These galls were also found at the foot of the Nilgiris at Kallar.

11-13. *Iseilema* spp.—A few galls were noted on *Iseilema anthephoroides* at Pattikonda, Kurnool District, in September 1916. Flies not reared. Old galls were noted at Samalkota on *Iseilema laxum*. At Palur, S. Arcot District, a few galls were found on a grass very like *Iseilema*, but which could not be identified on account of the inflorescence not having been found. Two flies were reared, of which one has been sent for identification.

14. *Ophiurus corymbosus*.—A tall erect grass with brittle stems, growing in thick clumps in moist depressions at Pattikonda, Kurnool District. Galls were found in side shoots arising from the collar region and sometimes higher up the stem. Young shoots coming up from the underground stems were also infested and showed specially thick and stout formations. Flies were not reared.

15. *Oryza sativa* (wild paddy).—This was found growing luxuriantly in depressions along the railway line at Samalkota. Silver-shoots were common, but flies could not be reared out owing to heavy parasitisation.

16. *Ischaemum pilosum*.—The road from Adoni to Siruguppa traverses a vast stretch of undulating black soil country. The fields of indifferent cultivators in these black soils are generally infested with "Kundara gaddi" (Telugu)—*Ischaemum pilosum*—a grass with a system of spreading under-ground stems—proving as bad a weed as "Hariali" (*Cynodon*) or Nuttgrass (*Cyperus*). Here and there in the midst of large patches of this grass, stiff, stout shoots of bright pink colour 4 to 6 inches long, were noted in September 1916 standing out from the surface of the ground. They ended bluntly, and in most of them the

empty pupal skin of a fly was borne at the tip, from which circumstance their true nature was easily recognized. These are in all probability the very galls described by Mr. L. A. Boodle in Kew Bulletin No. 3 of 1910 in an article on "Galls on an Indian Grass." The galls described therein were reported to have been collected by Mr. Talbot, a Forest Officer at Poona. From the material then available, viz. the pupal skins and specimens of young larvae, Professor Kieffer described the fly¹ as *Oligotrophus ischaemi* n. sp. I am not aware if the adult flies have been reared and described. In September, 1916, while examining the galls, I had the rare luck of securing two freshly emerged female specimens and one of the male. Two more were also reared out from galls. The females are rather large, black flies with an immense abdomen and short piceous wings. The males are also black but much smaller. The females were, on account of their wings being short, unable to fly. Eggs were readily laid in tubes and hatched in three days. This fly seems to breed only in the rains, and how it passes the long dry season in these arid plains is a mystery. Possibly the young larvae remain quiescent in the nascent buds underground and develop when the latter shoot out after the rains.

The above grasses are the only ones in which I have noted these gall formations, but I am sure the number will be doubled or even trebled if the subject be systematically taken up and worked out.

There are some general factors governing these gall flies even in the matter of parasitisation. The parasites attacking the gall maggots may be divided into two distinct classes: (1) A group, the members of which parasitise the grown-up maggot or the pupa. The mother parasite seeks the gall and inserts its eggs inside with its ovipositor, the grubs that hatch out attack and feed on the maggot or the pupa which is usually previously paralysed by the mother wasp. Coming under this group are several parasites belonging to two or three families of the super-family Chalcidoidea. (2) A second group which parasitises the eggs. The parasites coming under this group are Proctotrupids. The adult wasp hunts out the eggs of the Cecidomyiid and deposits one or more eggs into each egg. The egg thus parasitised hatches normally into a maggot which searches for and enters the terminal buds of shoots and therein feeds and grows.

In the case of one of the parasites, *Platygaster oryzae*, several eggs seem to be deposited in a single Cecidomyiid egg, and when the gall maggot becomes full-grown the parasite larvae (20 to 30 in number) also grow up feeding on the internal tissues of the host. Ultimately the maggot is reduced to an empty bag, inside which the parasite larvae spin tiny oval

¹ Prof. Felt has identified it as *Hormomyia ischaemi*, Kief.

cocoons and pupate. *Platygaster oryzae* is a black species common in galls on paddy, *Panicum*, etc., in most of the paddy areas. In the Bellary and Kurnool districts a yellow brown species of *Platygaster* was common in the galls of various grasses such as *Ischaemum*, *Ophiurus*, *Andropogon*, etc.

In the case of a third Proctotrupid only a single egg is apparently laid in each Cecidomyiid egg. The parasite larva kills the maggot when about half-grown, shoves off its excrement and the remnants of the internal tissues of the host into a corner of the hollow skin and pupates inside in a cocoon. This Proctotrupid is a black species about twice as large as *Platygaster*.

The above notes are mainly the result of stray observations made when opportunities occurred, and are confessedly imperfect in a good many details, and I shall be amply repaid if this paper would induce workers to take interest in this obscure group and fill up the many lacunae that are at present perceptible in our knowledge of galls on Indian grasses.

EXPLANATION OF PLATE X.

FIG. 1.—The picture on the left shows three galls in *Panicum fluitans*; the one on the right, two similar formations in *Apluda varia*. In the latter, the grey object dimly seen at the angle of the leaf axis on the shaded background at the top represents the empty pupal skin sticking out from the tip of the hollow gall.

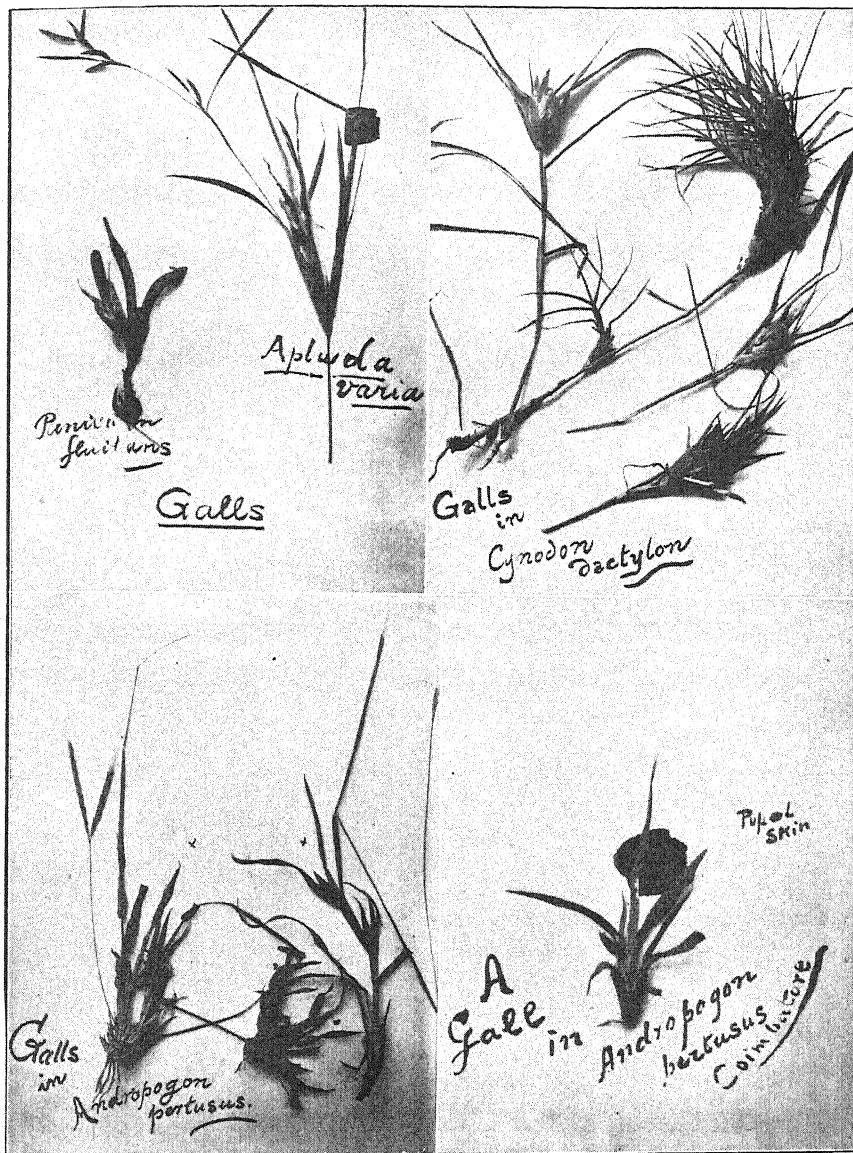
FIG. 2.—Compound galls in various stages of formation in *Cynodon dactylon*.

FIG. 3.—Galls in *Andropogon pertusus*. They are not distinct in the photographs, but their positions are indicated by the cross-marks.

FIG. 4.—Shows a single shoot with the central gall in *Andropogon pertusus*. The pale object seen feebly projecting from the shoot on the shaded background is the pupal skin.

1

2



3

4

JANUARY, 1917.

The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 3rd January, 1917, at 9-15 P.M.

LIEUT.-COL. SIR LEONARD ROGERS, K.T., C.I.E., M.D., B.S., F.R.C.P., F.R.C.S., F.A.S.B., F.R.S., I.M.S., President, in the chair.

The following members were present :—

Maulavi Abdul Wali, Dr. N. Annandale, Dr. F. H. Gravely, Mr. R. D. Mehta, C.I.E., Hon'ble Mr. F. J. Monahan, Maulavi Mahammed Kazim Shirazi, Babu Ganapati Sircar, Dr. Satis Chandra Vidyabhusana, Mr. E. Vredenburg.

Visitors :—Babu B. L. Banerjee, and Babu Nritya Gopal Sarkar.

The minutes of the last meeting were read and confirmed.

Eighteen presentations were announced.

The General Secretary reported that Lieut.-Col. W. J. Buchanan, I.M.S., Mr. L. S. S. O'Malley, I.C.S., and Babu Brajendranath Seal had expressed a desire to withdraw from the Society.

The President announced that in accordance with Rule 38 of the Society's Rules, the names of the following twenty-six members had been posted up as defaulting members since the last meeting, and their names have now been removed from the member list :—

Maulavi Abdus Salam, Presidency Magistrate, Calcutta.

Maulavi Abul Aas, Bankipur.

Munshi Ahmed Hosein Khan, Jhelum.

Maulavi Abdur Rahim, Calcutta.

S. A. Ashgar, Esq., Bar.-at-law, Calcutta.

Babu Jogindra Chunder Ghose, Pleader, Calcutta.

Babu Abhoy Sankar Guha, Nowgong.

Babu Bepin Behari Gupta, Chinsurah.

Babu Hem Chandra Goswami, Tezpur.

S. C. Ghatak, Esq., Dacca.

R. S. Hirst, Esq., Ranchi.

W. A. Lee, Esq., Calcutta.

Maulavi Midhat Hosen Khan, Simla.

Babu Manmatha Nath Moitra, Serampur.

Syed Muzaffar Ali Khan, Mazaffarnagar.

Babu Gobin Lal Mookerjee, Calcutta.
 Rai Sahib Srikrishna Mohapatra, Puri.
 Nawab Murtaza Hosain Khan, Lucknow.
 Babu Manahar Lal, Barrackpur.
 Captain V. B. Nesfield, I.M.S., Banda.
 Babu Jyoti Prakas Nandi, Burdwan.
 Babu Surendra Chandra Rai Chaudhuri, Rungpur.
 Babu Girindra Kumar Sen, Calcutta.
 Syed Fida Ali, Arrah.
 Babu Sri Ram Poplai, Jullundur City.
 Kumar Shyma Kumar Tagore, Calcutta.

Babu Rakhal Das Banerji exhibited a gold coin of Samudra-Gupta found in the Burdwan District of Bengal.

Babu Rakhal Das Banerji also showed a number of lantern slides of sculptures illustrating the Life-story of Buddha.

The following papers were read :—

(Abstract).

1. *Antiquities of Kalna.* By MAULAVI ABDUL WALI.

It appears that Kalna in the District of Burdwan was a celebrated place during the Muhammadan Rule. The ruins of a large fort which was constructed to command the river are still visible. The tomb and tank of Majlis Şahib are still to be seen there. The first of the three ancient mosques in chronological order was built in 898 H. or 1490 A.D. during the short reign of Nāsirud-Din Abul Mujahid Mahmud Shah of the Abyssinian Dynasty. The second mosque was built by Ulugh Masnad Khān during the still shorter reign of 'Ālāu'ddin Ab'ul Muẓaffar Firōz Shah, grandson of Husayn Shāh, in the year 939 H. = 1533 A.D. Omissions in the text of the inscription of this mosque published in the Journal A.S.B. for 1872 have been noted. The third mosque by Sarwar Khān, an Amir of Şulţan Ghiyāthud-Din Abu'l Muẓaffar Bahādūr Shah of the Sur Dynasty, was constructed in 960 H. = 1560 A.D. A modern mosque by Khayrullah has been noticed.

2. *The Antiquities of Burdwan.* By MAULAVI ABDUL WALI.

3. *Madaran and Mubarak-Manzi, in the District of Hugli.* By MAULAVI ABDUL WALI.

4. *Alam Khan's Mosque at Katwa.* By MAULAVI ABDUL WALI.

5. *The Topkhana Mosque at Santipur.* By MAULAVI ABDUL WALI.

Papers Nos. 2-5 are being published in the Journal.

The President announced that there would be no meeting of the Medical Section during this month.

FEBRUARY, 1917.

The Annual Meeting of the Society was held on Wednesday, the 7th February, 1917, at 9-15 P.M.

LIEUT.-COL. SIR LEONARD ROGERS, KT., C.I.E., M.D., B.S., F.R.C.P., F.R.C.S., F.A.S.B., F.R.S., I.M.S., President, in the chair.

The following members were present :—

Maulavi Abdul Wali, Dr. N. Annandale, Babu Rakhal Das Banerjee, Captain C. A. Boyle, Dr. H. G. Carter, Miss M. L. Cleghorn, Mr. G. de P. Cotter, Babu Hem Chandra Das-Gupta, Mr. E. Digby, Dr. F. H. Gravely, Dr. H. H. Hayden, C.I.E., Mr. A. H. Harley, Dr. W. C. Hossack, Rev. H. Hosten, S.J., Mr. S. W. Kemp, Mr. D. McLean, Mr. R. D. Mehta, C.I.E., Mr. C. S. Middlemiss, Rev. R. Oka, Vaidyaratna Kaviraj Jogindra Nath Sen, Mahamahopadhyaya Haraprasad Shastri, C.I.E., Maulavi Aga Mahomed Kazim Shirazi, Dr. A. Suhrawardy, Lieut.-Col. W. J. Sutherland, I.M.S., Dr. Satis Chandra Vidyabhusana, Mr. E. Vredenburg.

Visitors :—Rev. S. Ameye, S.J., Mr. C. Cleghorn, Miss O. Cleghorn, Miss R. Coughtric, Mr. R. C. Foskett, Mrs. A. H. Harley, Rev. A. Lullemond, S.J., and three others.

The President ordered the distribution of the voting papers for the election of Officers and Members of Council for 1917, and appointed Mr. E. Digby and Maulavi Abdul Wali to be scrutineers.

The President ordered the distribution of the voting papers for the election of Fellows of the Society and appointed Dr. H. G. Carter and Babu Hem Chandra Das-Gupta to be scrutineers.

The President announced that the Elliott Prize for Scientific Research for the year 1916 would not be awarded as none of the essays received in competition was of sufficient merit to justify the award of the Prize.

The President also announced that the Barclay Memorial Medal for the year 1917 had been awarded to Lieut.-Col. H. H. Godwin-Austen, F.Z.S., F.R.G.S., F.R.S.

The Annual Report was then presented.

ANNUAL REPORT FOR 1916.

The Council of the Asiatic Society has the honour to submit the following report on the state of Society's affairs during the year ending 31st December, 1916.

Member List.

The number of Ordinary Members at the close of 1916 was 407, against 445 at the close of 1915. The number of Ordinary Members elected during 1916 was 26. Out of these 2 have not yet paid their entrance fees. The number of Ordinary Members added to the list is, therefore, 24. On the other hand, 13 withdrew, 12 died, 34 were struck off under Rule 38, and 3 were struck off under Rule 40.

The number of Ordinary Members in the past six years was as follows:—

YEAR.	PAYING.				NON-PAYING.			GRAND TOTAL.
	Resident.	Non-Resident.	Foreign.	Total.	Life.	Absent.	Total.	
1911	200	225	19	444	22	53	75	519
1912	203	229	19	451	23	43	66	517
1913	200	211	19	430	23	46	69	499
1914	191	187	19	397	26	50	76	473
1915	171	188	21	380	25	40	65	445
1916	145	159	18	322	25	60	85	407

The following members died during the course of this year:—

Nawabzada A. K. M. Abdus Subhan, Khan Bahadur; Dr. Robert Arnold Barker, F.G.S. (Life Member); Dr. Satis Chandra Banerjee; Rai Bahadur Bhawani Das Batra; Mr. R. C. Burton; Raja Saccidananda Tribhuban Deb; Captain Sidney Morton, 24th Punjabis; Mr. M. S. Ramaswami; Mr. Robert V. Russel, I.C.S.; Maulavi Sofulla Saifuddin Ahmed; Mr. Edward Thornton, F.R.I.B.A.; Major Horace Hayman Wilson, King's Own Royal Lancaster Regiment.

One member, Mr. J. N. Das-Gupta, has compounded for his subscriptions during this year.

The number of Special Honorary Centenary Members remains unchanged.

There were four deaths among the Honorary Fellows, viz.: Monsieur Rene Zieller, Sir William Ramsay, Sir Clements Markham, and Sir William Turner. Dr. G. A. Boulenger has been elected to fill one of the vacancies. The total number of Honorary Fellows now is 26.

Fellows of the Society.

At the Annual Meeting held on the 2nd February, 1916, Lieut.-Col. C. Donovan, M.D., I.M.S., The Hon'ble Mr. R. Burn, I.C.S., and Mr. L. L. Fermor, A.R.S.M., D.Sc., F.G.S., were elected Fellows of the Society.

On Dr. David Hooper, F.C.S., F.L.S., resigning his Ordinary Membership of the Society, he ceased to be a Fellow under Rule 2 A of the Society's Rules.

There were 33 Fellows on the list at the end of 1916.

Office-bearers.

At the end of February, Dr. Annandale was appointed Anthropological Secretary in the place of Mr. J. Coggin Brown, resigned. There have been no other changes among the Officers of the Society. Mr. H. Nelson Wright was the Hon. Numismatist, with the care of the coin cabinet, until the end of February when he left for Europe, and Mr. H. Nevill, I.C.S., was appointed to act for him. Mr. C. J. Brown has continued to report on all Treasure Trove coins sent to the Society from the Central Provinces.

Office.

Mr. J. H. Elliott has continued as Assistant Secretary throughout the year, with the exception of three weeks in July when he was ill.

Babu Suresh Chandra Banerji, the Pandit of the Society, was absent from 5th June to 1st July on account of illness and again from 1st to 20th December owing to his mother's death.

Lama Lopsang, who was looking after the Tibetan collections belonging to the Society, died on 2nd August 1916, and Lama Chhewang Rinchen was appointed in his place. Lama Chhewang Rinchen worked until the end of October when he resigned owing to illness. No further appointment has been made.

Society's Premises and Property.

The building of the new premises for the Society has not yet been taken in hand.

In consultation with Mr. H. A. Crouch, Consulting Architect

to the Government of Bengal, the Council accepted Messrs. Martin & Co.'s estimate of Rs. 2,505 for urgent repairs.

Col. H. H. Godwin-Austen, F.R.S., has presented through Dr. Annandale a photograph of himself. It is hoped that this photograph, together with other similar portraits that we possess of our more distinguished members, may ultimately be framed in such a way as to allow them to be hung in a group; but money cannot at present be found for this.

Indian Museum.

The Hon'ble Justice Sir Asutosh Mukhopadhyaya, Kt., C.S.I., D.Sc., F.R.A.S., F.R.S.E., was re-appointed by the Council to represent the Society on the Board of Trustees.

Indian Science Congress.

The Third Indian Science Congress was held in Lucknow on the 13th, 14th and 15th January, 1916, under the presidency of Colonel Sir Sidney Burrard, K.C.S.I., R.E., F.R.S. The meetings were attended by over 300 members and visitors and some 70 papers were communicated, abstracts of which have been published in our Proceedings, Vol. XII, 1916, pp. lxxix-cxxvii, pl. A and B.

It was arranged that the Fourth Indian Science Congress should be held at Bangalore on the 10th, 11th, 12th and 13th January, 1917. His Highness the Maharaja of Mysore consented to be Patron and Sir Alfred Bourne, K.C.I.E., F.R.S., was appointed President with Dr. J. L. Simonsen as Honorary Secretary.

The Government of India have issued orders that selected Officers from the various Provinces, who can be spared, may be permitted to attend on duty the three Meetings of the Indian Science Congress to be held in 1917, 1918 and 1919 respectively.

Meetings.

The Society's General Meetings have been held regularly every month, with the exception of the recess months of September and October, 1916.

With the kind permission of Dr. N. Annandale, the Society's General Meetings on the 1st November and 6th December, 1916, were held at the Museum House, the Society's Hall being under repair.

Lectures.

During the year, three lectures were delivered:—(1 & 2) On March 24th and 31st respectively, two lectures on his recent tour in the Far East, illustrated by lantern slides, by Dr. N. Annan-

dale, C.M.Z.S., F.L.S., F.A.S.B. The first lecture dealt with Japan and the second with China and Siam. Both lectures were delivered in the Indian Museum Lecture Room. (3) On April 7th at the Society's House, a lecture on the Pre-Indian Home of the Aryans, by Babu Jagadish Chandra Chatterji, Vidyavaridhi, B.A.

Agencies.

Mr. Bernard Quaritch has continued as the Society's Agent in Europe.

On being informed by Mr. Quaritch that the Society's publications could be sent to him with safety, all numbers of the Journal and Proceedings, Memoirs and Bibliotheca Indica due to various Societies in Europe since the commencement of the war were sent for distribution. No copies of the Journal and Proceedings, Memoirs or Bibliotheca Indica were sent to Mr. Quaritch for sale, owing to orders prohibiting the transmission of books for sale to Europe.

The two cases containing the Society's publications sent to Mr. Otto Harrossowtiz on the 9th July, 1914, per SS. *Katten-turm*, have not yet been recovered. The question of obtaining delivery of these two cases is under consideration by the Council.

Barclay Memorial Medal.

In terms of Rule 1 of the Barclay Memorial Medal, there was no award during the year.

In connection with the award for 1917, the following members were appointed to form a Special Committee to make recommendations to the Council:—P. J. Bruhl, Esq., D.Sc., F.A.S.B. (ex-officio); Lieut.-Col. W. D. Sutherland, M.D., I.M.S.; Major R. E. Lloyd, M.B., B.Sc., I.M.S.; H. G. Carter, Esq., M.B., Ch.B.; and B. L. Chaudhuri, Esq., B.A., D.Sc., F.R.S.E., F.L.S.

Elliott Prize for Scientific Research.

Six essays were received in competition for the Elliott Prize for Scientific Research during 1915, but none of them dealt with the subjects notified. No prize, therefore, was given.

The subject selected for the Elliott Gold Medal for the year 1916 was Chemistry, and the Notification appeared in the *Calcutta Gazette* of the 12th January, 1916. Four essays have been received in competition and have been referred to the Trustees for report.

Finance.

The appendix contains the usual statements showing the accounts of the Asiatic Society of Bengal for the year 1916. In this year's account there is an additional statement under the head "Indian Science Congress."

The Society has received the usual annual grants of Rs. 20,800 and of Rs. 11,000 from the Governments of Bengal and India respectively as under:—

From the Government of Bengal—	Rs.	Vide Statement.
Oriental Publication Fund No. 1	9,000	No. 2
Do. No. 2	3,000	„ 3
Sans. MSS. Fund ..	3,200	„ 5
Anthropological Fund ..	2,000	„ 6
Bureau of Information and Cata- loguing Sans. MSS... ..	3,600	„ 7
Total ..	20,800	

From the Government of India—	Rs.	Vide Statement.
Arabic and Persian MSS. Fund ..	5,000	No. 8
Bardic Chronicle Fund ..	6,000	„ 9
Total ..	11,000	

As regards the Society's investments, which are shown in statement No. XIV, Government Securities of the face value of Rs. 2,58,800 are held by the Bank of Bengal for Safe Custody. In addition we have $3\frac{1}{2}\%$ Government Promissory Notes of the face value of Rs. 500, in the custody of the Alliance Bank of Simla, Ltd., belonging to the Barclay Memorial Fund. Altogether we hold $3\frac{1}{2}\%$ Government Promissory Notes of the face value Rs. 2,59,300. They cost Rs. 2,56,163-8-10, the average purchase price being Rs. 98-12-9. The market price at the time of writing this report is nominally Rs. 75.

The Budget for the year 1916 was estimated at the following figures:—

	Rs.
Receipts	20,810
Expenditure	24,022

The receipts for the year, inclusive of one compounding fee of Rs. 100, have amounted to Rs. 22,367-15 or Rs. 1,557-15 more than the estimate.

The receipts have exceeded the estimates under the following heads:—

	Rs.
Members' Subscriptions	1,328
Subscription for the Society's <i>Journal</i> , <i>Proceedings</i> and <i>Memoirs</i>	172
Interest on Investments	299
Miscellaneous	75
Admission fees	36

The receipts have fallen short of the estimate under the following head :—

	Rs.
Sale of Publications	452

The expenditure for the year has amounted to Rs. 25,373-7-2 or Rs. 1,351-7-2 in excess of the estimate.

The Permanent Reserve Fund has been increased by Rs. 800 from admission fees, and one compounding subscription, and at the close of the year it stands at Rs. 1,67,000.

The difference between the total estimated and actual expenditure last year was more than accounted for by heavy expenditure on publications. The sum of Rs. 3,005 that has been required to make good the difference between actual receipts and expenditure has been met from our current account.

The Budget Estimate of probable Receipts and Expenditure for the year 1917 is as follows :—

	Rs.		Rs.
Receipts ..	20,960	Ordinary Expenditure	23,253
		Extraordinary Expenditure ..	2,705
		Total ..	25,958

The excess expenditure for which provision has to be made this year, viz. Rs. 4,998, will be met by drawing on the Temporary Reserve Fund, unless the income should prove larger than anticipated. The financial position is, therefore, somewhat weaker than at the close of the preceding year.

BUDGET ESTIMATE FOR 1917.

Receipts.

	1916. Estimate.	1916. Actuals.	1917. Estimate.
	Rs	Rs.	Rs.
Members' Subscriptions ..	9,400	10,728	10,000
Subscriptions for the Society's <i>Journal and Proceedings and Memoirs</i> ..	1,700	1,872	1,700
Sale of Publications ..	600	148	200
Interest on Investments ..	7,360	7,659	7,660
Rent of Room ..	950	950	600
Miscellaneous ..	100	175	100
Admission fees ..	700	736	700
Compounded subscription ..	..	100	..
Total ..	20,810	22,368	20,960

Expenditure.

	1916. Estimate.	1916. Actual.	1917. Estimate.
	Rs.	Rs.	Rs.
<i>Ordinary.</i>			
Salaries	7,092	6,754	6,597
Commission	550	625	600
Pension	180	180	180
Stationery	150	146	200
Lights and Fans	175	288	225
Municipal Taxes	1,495	1,495	1,495
Postage	700	743	600
Freight	150	51	807
Contingencies	400	500	500
Books	3,117	2,944	2,000
Binding	1,000	351	700
To meet excess expenditure on publications sanctioned during last year .. ..	..	..	2,000
<i>Journal and Memoirs</i> (general expenditure)	6,000	8,379	2,000
Numismatic Supplement .. ..	..	..	600
Special Vol. of Memoirs .. ..	..	..	2,600
Proceedings .. ..	..	..	600
Indexes .. ..	..	..	200
Printing (Circulars, etc.)	500	606	350
Auditor's fee	150	150	150
Petty Repairs	25	17	75
Insurance	344	344	344
Grain Allowance	150	106	130
Furniture	150	..	300
<i>Extraordinary.</i>			
Bardic Chronicles (Dr. Tessi- tori's travelling expenses for 1915)	1,694	1,694	..
Gratuity .. ..	..	20	..
Repairs .. ..	..	..	2,505
Servants' clothing .. ..	..	..	200
Total	<u>24,022</u>	<u>25,373</u>	<u>25,958</u>

Library.

The total number of volumes and parts of magazines added to the Library during the year was 1,805, of which 217 were purchased and 1,588 were either presented or received in exchange.

Sixteen manuscript copies of bardic books have been presented to the Society's library by the Political Member of

the State Council of Bikaner, through the Resident of the Western Rajputana States, Jodhpur.

The Council, acting on the suggestion of Lieut.-Col. Sir Leonard Rogers, Kt., has approved the transfer of all Medical Journals to the library of the School of Tropical Medicine, on the understanding that all expenditure incurred by the Society, on the purchase or binding of these works, shall be refunded. The amount recovered from this source will be spent on completing other scientific serials in the Society's library.

The form of indemnity bond to be used in connection with the loan of manuscripts, drawn up by Mr. H. C. Kesteven, has been approved by the Council. New rules have been passed regarding the lending out of Government manuscripts.

The manuscript of the Catalogue of Scientific Serial Publications available in Calcutta is almost ready, but no part has yet been sent to press owing to lack of funds.

The Society's library is open to members daily from 10 A.M. to 5 P.M. and on Wednesdays, until 7-30 P.M.

Publications.

Nine numbers of the Journal and Proceedings (Vol. XI, Nos. 7-11 and Vol. XII, Nos. 1-6) were published during the year, containing 776 pages and 18 plates.

Four numbers of the Memoirs were published (Vol. IV, No. 2; Vol. V, No. 4; Vol. V, Extra No., pages 93-113; and Vol. VI, pages 1-74), containing 300 pages and 4 plates.

Manuscripts of the Indexes to the Journal and Proceedings (Vol. VIII, 1912 and Vol. IX, 1913) are nearly ready for press and it is hoped that they will be published at an early date.

In order to expedite the publication of papers in the Journal, the Council has resolved to publish a few separate copies of each paper as soon as it is ready, instead of waiting till sufficient matter for a full number is in hand. The Proceedings are now being published in larger batches at longer intervals, and the practice of identifying the various numbers of the Journal with the months of the Proceedings published with them, having proved misleading and inconvenient, has been abandoned.

A revised edition of the Society's Rules and Regulations has been published.

Exchange of Publications.

During the year, the Council accepted three applications for exchange of publications, viz. (1) from the Ohio State University, Columbus; the Society's Journal and Proceedings and the Memoirs to be exchanged for their periodical "The Ohio Journal of Science"; (2) from the Bihar and Orissa Research Society; the Society's Journal and Proceedings and the Memoirs

for their Journal; (3) from the Mythic Society, Bangalore; the Society's Journal and Proceedings and the Memoirs in exchange for their Quarterly Journal.

On an application from the Ohio State University, Columbus, offering vols. 1-15 of the Ohio Naturalist, 1900-1915, the series issued previous to the Ohio Journal of Science, the Council agreed to send them the back vols. of the Society's Journal from 1875.

Philology, etc.

Rev. H. Hosten has edited a paper on Portuguese Losses in Indian Seas between A.D. 1627-1636. The losses were inflicted by the Dutch, and are estimated at 30 millions, apart from those incurred in the Southern Seas. He has also edited some old records of the Madras Army which contain seven unpublished papers. Among them are copies of two letters between Clive and Watson, a list of French ships, and four lists of English and French prisoners.

In his Note on the *Tārikh-i-Salāṭin-i-Afāghana* by Aḥmad Yādgar, Mr. H. Beveridge discusses the historical value of the work, and the date of its composition.

Mr. H. Beveridge also contributes some notes on Father Monserrate's *Mongolicae Legationis Commentarius* in two instalments. These notes illustrate many incidents in Akbar's reign.

Mr. L. F. Rushbrook Williams describes a work entitled *Aḥsan al-Siyar*, the 4th volume of which he found at the Nawab of Rampur's library. He says that it contains much information about Babur, and will clear up some disputed points.

In his note on a Buddhist Sculpture from Kandy, Ceylon, Dr. Vogel gives an account of a sculpture which came into the possession of a British officer at the capture of Kandy in 1815 A.D. and now belongs to His Excellency Lord Carmichael. The sculpture, which represents the eight principal events in the life of Buddha, is supposed to have been brought into Ceylon from Buddha Gaya about 1000-1200 A.D.

Babu Rakhal Das Banerji contributed a paper containing the revised text, with translation, of the Talcher Plate of Gayāḍa-tuṅgadeva, a plate which records the gift of a village in Tuṅkhera viṣaya to three Brahmans, one of whom is said to have come from Vārendra maṇḍala, and another from Srāvastī, in about the 11th century A.D.

Dr. E. D. Ross, C.I.E., and Mahamahopadhyaya Satis Chandra Vidyabhusana, have edited in the Memoirs the well-known Sanskrit-Tibetan lexicon called *Mahāvvyutpatti*, part II. which was copied from the Tangyur and translated into English about a century ago by the Siculo-Hungarian Scholar Alexander Csoma de Koros. Kazi Dawa-Sam-Dup, in his paper on a Tibetan funeral prayer publishes the text and translation of a Tibetan hymn which is supposed to have been composed by King Srong

tsan-gam-po in the 7th century A.D., and is now chanted on all solemn occasions, fast-days and other holidays. In an account of Taxila as a seat of learning, Babu Bimala Charan Law brings together passages from Pali Jatakas to show that Taxila was an important educational centre, in which three Vedas and eighteen Vijiās were taught.

In his note on the Bengal School of Artists, Babu Surendra Nath Kumar, while describing a stone-image from the district of Burdwan, maintains that there was but one School of Art in the whole of Bengal and Bihar, and that no proofs were available for the existence of a separate Eastern School of Artists. Rai Monmohan Chakravarti Bahadur has contributed to our journal several interesting papers which throw a good deal of light on the History of Bengal, Bihar and Orissa during the Mahomedan period. In his note on the geography of Orissa in the sixteenth century the Rai Bahadur discusses all geographical information available about Orissa in such books as *Mādālā Pañjī* and *Ain-i-Akbari*, while in his History of Mithila during the pre-Mughal period he gives a fairly full account of the Kārṇāṭa dynasty and the dynasty of Kāmeśvara that ruled in Darbhanga in the fourteenth and succeeding centuries. His History of Navya Nyāya contains a list of Brahmanic writers on Modern Logic with their approximate dates; and his contributions to the history of Smṛiti, of which two parts have been published, furnish us with some useful information about the Brahmanic law-givers that flourished in Bengal and Mithila in the eleventh and succeeding centuries.

Anthropology.

Four short papers on ethnographical subjects were published in the Journal of the Society in 1916. They were:—North Indian Folk-Medicine for Hydrophobia and Scorpion-Sting, by Sarat Chandra Mitra, M.A., B.L.; On North Indian Charms for Securing Immunity from the Virus of Scorpion-Stings, by Sarat Chandra Mitra; The Invention of Fire, by H. G. Graves; Demon-Cultus in Mundari Children's Games, by Sarat Chandra Mitra.

Sir George Duff-Sutherland-Dunbar has published in the Memoirs, as an appendix to his report on the Abors and Gailongs, a personal narrative of a visit to Pemakoichen.

Zoology, Botany, and Geology.

ZOOLOGY.

Mr. Baini Parshad published an interesting essay on the Seasonal Conditions governing Pond Life in the Panjab. The material was chiefly obtained from natural freshwater ponds or from pools left on the banks of rivers receding in autumn. Observations were made on *Hydra oligactis*, *Spongilla carteri*,

Spongilla lacustris, *Austrolella indica*, *Daphnia* spp. and larvae of *Chironomus* and *Anopheles*.

Dr. Annandale concluded his series of interesting papers on the fauna of the Jordan System with a paper on the distribution and origin of that fauna, with special reference to the fauna of the lake of Tiberias. The paper contains a list of the aquatic fauna of the Tiberias basin, an account of the distribution of the aquatic fauna of that basin, a disquisition on the origin of the fauna of the Jordan System and a reference to the more recent and more important works on the aquatic animals of that System.

The Society has undertaken to publish the results of Dr. Annandale's recent tour in the Far East in a special volume of the Memoirs. The first instalment, published last December, contains short descriptions of the physical features of Lake Biwa in Japan, the Tai Hu situated in the delta of the Yangtsi-Kiang, and the Talé Sap in Siam; and deals further with the Polyzoa Entoprocta and Ctenostomata obtained from the last two lakes. New are the genus *Chitaspis*, represented by *Chitaspis athleticus*, and the species *Paludicella pentagonalis* and *Hispia malayensis*. The Memoir further deals with the Mollusca of Lake Biwa, a number of which are illustrated, and contains a discussion of the general geographical distribution of the species met with in Lake Biwa and their distribution into various life zones, the classification being under the headings "Rupicolous," "Shallow Water," "Deep Water" and "Non-Lacustrine."

BOTANY.

Mr. I. H. Burkill presented an interesting note on the Terai Forests between the Gandak and the Teesta, based partly on his own observations and partly on existing records. The author discusses the influence which man, aided by fire, has exercised on the history of the Terai belt, and the important part played by the sand cones deposited by the rivers traversing the Terai in determining the courses of the trade routes from Tibet to the gangetic plains.

A series of notes on the pollination of flowers in India, by Mr. I. H. Burkill, is concluded by a note on the flowers of numerous species of plants visited by birds, sphingids, butterflies, hymenoptera, and various other insects. The late Mr. M. S. Ramaswami describes a new species of *Tephrosia*, named *Tephrosia falciformis*, and regarded by him as the type of a distinct section.

PALAEONTOLOGY.

Mr. H. C. Das-Gupta gives an account of triassic, jurassic, Gieumal sandstone, and tertiary fossils collected during a tour through Hazara. He describes *Corbula middlemissii* and *Nautilus hazaraensis* as new.

Physics and Chemistry.

In a paper on the action of light on silver chloride read before the Indian Science Congress and published in our Journal, Prof. P. S. Macmohan attacks the vexed problem of the nature of the coloured product obtained by the action of light on silver chloride. The suggestion is put forward that the photochemical decomposition of silver chloride is attended by a partial oxidation of the colloidal silver produced, but the question is whether silver oxide or hydroxide is necessarily associated with the coloured product or only accidentally admixed.

A note on the constituents of the bark of *Hymenodictyon excelsum* was read by Mr. Charles Stanley Gibson and Dr. John Lionel Simonsen, before the Indian Science Congress, and published in our Journal. The authors isolated aesculin and scopoletin, but were unable to find any traces of an alkaloid.

Mr. J. Evershed presented an interesting short paper, accompanied by photographs, on Sunspots and Prominences. Photographs of the limb of the sun's disc are taken daily at Kodaikanal Observatory. The author arrives at the conclusion that some repulsive force acts on prominences, as on the tails of comets, and suggests that light-pressure is concerned in the act, but declares that astronomers are not yet in a position to explain what forces cause prominences to assume the many strange and varied shapes which photography reveal.

Medical Section.

Owing to the continuance of the war and the absence of so many members there has been little activity in the medical section. Only two meetings have been held and the attendance has been meagre. Valuable papers, which evoked considerable discussion, have been read on the subject of the treatment of the Kala-azar by the intravenous injection of antimony, by Sir Leonard Rogers and Dr. Brahmachari. Dr. Hossack read a paper on modern bacteriology.

International Catalogue of Scientific Literature.

During the year Invoices for 192 copies of the International Catalogue were received, but no copies came to hand.

Subscriptions to the total value of Rs. 1,335-6-0 were received and these were remitted to the Central Bureau together with the amount in hand at the beginning of the year, after the usual deduction of the discount allowed by the publishers.

Catalogue slips numbering 744 have been despatched during the year.

The expenses of the Regional Bureau for the year 1916 amounted to Rs. 457-14-6.

The Bureau of Information.

A number of queries from various parts of India were answered during the year under review. The most important matters dealt with were these :—

Sir Sankaran Nair, who has two chests full of ancestral MSS., sent a specimen for decipherment, as he had been unable to find anybody to read them. On a very close examination it appeared to be in the now defunct vattelluttu character, to have been composed in the Old Tamil language, and to have been copied in the 15th or 16th century A.D. The work is the Sixth Book of the Ramayana.

Another important query came from the Calcutta Corporation, as to the best method of disposing of the ashes in the cremation ground. All the MSS. on the subject of cremation were read and a reply was sent.

From a remote village came a question as to how to reconsecrate a Phallic Emblem of Siva, made impure by human excreta. The proper advice was given after consulting standard and authoritative works.

Many letters came from Alwar, the most important of them relating to the connection of Gopichand of Bengal and his uncle Bhathavi with Bhurthase's grave at Alwar.

Sir Edward Gait sent a number of inscriptions, of which seven have been read.

Some inscriptions came from the office of the Commissioner of Rajshahi and a query from the Commissioner of Tirhut.

Sanskrit Manuscript Search and Catalogue.

The staff was engaged in preparing descriptions of MSS. and in passing the specimen volume through the Press. All purchase of MSS. has been stopped by order of the Council, in order to facilitate the publication of the catalogue.

The specimen volume of the Catalogue of MSS. in the Government Collection is nearly ready. The number of MSS. described came to 8,300, the year's work being the description of 532 works.

Arabic and Persian Manuscript Search and Catalogue.

During the year only one Persian MS., entitled Sikandar-Nama, elegantly written and illustrated, was purchased on behalf of the Government of India. As in 1915, the efforts of the Officer-in-Charge of the Search were directed rather to ascertaining the existence and whereabouts of rare and interesting MSS. than to purchasing them, if in good keeping. Accordingly Maulavi Hāfiz Nazir Ahmad has prepared notices of 461 rare and important Arabic and Persian MSS. found in various libraries in India. Notices of 152 Arabic MSS., with an introductory description of a number of Indian libraries, are already in type and await publication in the Proceedings of the Society.

Maulavi Asad al-Zamān Khān has amplified, up to the historical portion, the printed Persian Catalogue of MSS. belonging to the Society. Maulavi Shāh Mu'in-al-Dīn Aḥmad has prepared an alphabetical list of 262 MSS. omitted in the first printed list of the Government of India collection. Maulavi Abū Mūsā Aḥmad-al-Haqq has prepared a hand-list of the commentaries on the Qur'ān belonging to the Government of India collection.

Bibliotheca Indica.

Of the three fasciculi published in the *Bibliotheca Indica* series during the year under review, two are continuations of old works, while the third is a new publication. The three fasciculi are as follows :—

1. Akbar-nāma, Vol. III., fasc. VIII.—translated into English from Persian by Mr. H. Beveridge, I.C.S. (retired).
2. Yoga-Śāstra, fasc. IV.—a Jaina Sanskrit work edited by Śāstra-viśārada Jainācārya Vijaya Dharma Sūri.
3. A Dictionary of the Kāshmiri language, Part I—edited by Sir George Grierson and M. M. Mukunda Rama Śāstri. This dictionary, based as it is on materials left by the late Pandita Iswara Kaul of Kāshmir, is a most comprehensive one, containing all important words of the Kāshmiri language, together with their synonyms in Sanskrit and Hindi, as well as copious explanations in English.

Bardic Chronicles.

During the year under review, thanks to the good will of the Government of India and the enthusiastic support of the Bikaner Durbar, successful attempts have been made to place the Bardic and Historical Survey of Rajputana on a firmer footing, and to eliminate the difficulties which had been handicapping the progress of the work last year. His Highness the Maharaja of Bikaner, at the end of the four months during which he had employed Dr. Tessitori to examine the manuscript materials in Bikaner, manifested a desire to retain Dr. Tessitori's services for a longer period, so as to enable him to compile a History of Bikaner and to edit some of the most interesting bardic poems referring to the State. He offered to contribute the cost of the work if the Government of India were willing to continue Dr. Tessitori's pay. Meanwhile, an offer was made by the Mewar Durbar to employ Dr. Tessitori in connection with the bardic materials in Udaipur, and willingness was expressed to contribute a certain sum towards the cost of his employment. Encouraged by these facts, but at the same time realising that big schemes were hardly suitable to the present time of financial stringency, Dr. Tessitori prepared a new Scheme for a Summary Survey, in which he proposed to deal only with the six principal States of Bikaner, Udaipur, Bundi, Jesalmer, Jai-pur, and Jodhpur, and to devote only one year to each of them.

The Scheme was submitted to the Government of India, and met with approval, and an annual grant of Rs. 6,000 for a period of five years was sanctioned to meet the cost of Dr. Tessitori's employment, independently of any contributions made by the States of Rajputana. The details of the Scheme for the Summary Survey will be given in the Progress Report for the year.

In accordance with arrangements made with the Society for the publication of the results of the Survey, two works, which had been prepared during the last year, were sent to Press, and will soon be issued. These are: the *Vacaniḡā Rāthōra Ratana Singhajī ri Mahesadāsōta ri* 1st part, and the first fasciculus of the Descriptive Catalogue of Bardic and Historical MSS., Section i, Part i, dealing with MSS. of prose chronicles extant in Jodhpur. Two more fasciculi of the Descriptive Catalogue have been prepared during the year, these being respectively the first fasciculi of Section i, Part ii and of Section ii, Part i. A great part of the bardic poetry relating to Bikaner has been examined, and a work is in preparation, in which all the most important commemorative songs referring to the Rulers of Bikaner from Rāva Vikō—the founder—to the present Ruler, Maharaja Colonel Sir Ganga Singh, will be collected and edited with critical and explanatory notes, and English translations. A Progress Report on the Work done during the year 1916, with appendices, has been prepared as usual, and will be shortly published, it is hoped, in this "Journal."

No regular search for manuscripts and inscriptions was undertaken till the conclusion of the arrangements, mentioned above, between the Government of India and the Bikaner Durbar; and the results of the exploration have therefore been much less notable than is to be expected in normal years. The exploration of the district was begun only in October. The number of impressions of inscriptions collected is about 110, the number of manuscripts purchased 6, and the number of manuscripts copied 29.

Coins.

Our relations with the Numismatic Society of India, which had never previously been defined, have been placed during the year on a thoroughly satisfactory basis.

A further feature of the year's work is the great activity displayed by members of the Numismatic Society and a welcome tendency on the part of members to specialise closely in the various branches of Indian numismatics. Three numismatic supplements were issued, and a number of valuable contributions are awaiting publication. Of chief importance are the labours of Professor S. H. Hodiwala, of Junagadh, on Mughal issues and obscure mints, and the contributions of Mr. Furdoonjee D. J. Paruck, of Bombay, to the further knowledge of

Sassanian numismatics. The publication of new coins shows that no field in India has yet been exhausted. The chief need of the present time is the collation and co-ordination of past contributions, and the Numismatic Society is working systematically towards this end. The difficulties are great, not the least being that of the cost involved in securing satisfactory reproductions.

During the past year thirteen lots of Treasure Trove coins have been sent to the Society, and a detailed account of them with their provenance is appended. No coins of peculiar interest have been sent in, but there were two useful finds of Mughals. Among these were the following rare coins: Aurangzeb-Ilahābād Baldat of 1071-3 R., Bhakhar 1076-8 R., Zafarābād 1070-3 R., and 1075-7 R., and a fine series of Gulkanda coins of that sovereign; and Muḥammad Shāh of Haidarābād, Farkhanda Bunyād 1143-13 R. There was a small find of the rare rupees of the Bahmani Dynasty, but these were too mutilated to be worth preserving. The only other find worth noting was that of 330 copper coins of the Mālwa (Hoshang Shāh) and Jaunpūr Kings; but in this there was no coin of special interest.

The majority of the coins went to Nagpur Museum, in which the Mughal series must now be very well represented.

Treasure Trove dealt with by the Society during 1916.

Nature of Find.	Number in Find.		Number distributed.		Provenance.
	₨	Æ	₨	Æ	
(1) Undecipherable thick Copper coins ..	..	134	..	..	Seoni Dt.
(2) Mahratta struck ..	9	..	..	..	Narsingpur Dt.
(3) Mughal rupees ..	42	..	17	..	Betul.
(4) Fire altar type of Rajputana ..	..	68	..	..	Mandla.
(5) Mahratta of Katak and Sūrat ..	13	..	..	..	Chhindwara.
(6) Mahratta of Katak and Sūrat ..	200	..	..	..	Chanda.
(7) Debased Ravishnagar Sagar type ..	7	..	..	..	Damoh.
(8) Bahmani rupees and 1 copper (rupees illegible) ..	8	1	..	1	Drug.
(9) Gadhiya paisa (one of 11 in find) ..	1	..	..	..	Nimar.
(10) Mahratta rupee ..	1	..	..	..	Bhandara.
(11) Mālwa and Jaunpūr ..	..	330	..	64	Jubbulpore.
(12) Mughals ..	262	..	99	..	Wardha.
(13) Mahratta rupees ..	2	..	..	..	Bhandara.
TOTAL ..	545	533	116	65	

Two gold and nine silver coins were presented to the Society's cabinet during the year. The coins were received from the Government of Assam; from the Archaeological Survey Western Circle; and from the Bombay Branch of the Royal Asiatic Society.

Lieut.-Col. Sir Leonard Rogers, Kt., President, delivered an Address to the Society.

Annual Address, 1917.

As the report of the Council for 1916 is already in the hands of the members I propose to follow the precedent I set last year of only mentioning the salient features of our work, and then to speaking on a subject which I hope may prove of some interest.

The work of our Society has made satisfactory progress during the past year, our publications having been exceptionally extensive and important, with the result that our expenditure has exceeded our income by almost five thousand rupees, the deficit having been met from our reserve fund. The philological and natural history sections have been particularly active. Among the former the publication of Part I of Sir George Grierson's dictionary of the Kashmiri language in the *Bibliotheca Indica*, and in the latter the first of a series of memoirs recording the results of Dr. Annandale's recent tour in the Far East are especially worthy of mention. Good progress has been made with the catalogue of Sanskrit manuscripts, a volume of which is ready for publication. The work of Dr. Tessitori on the Bardic and Historical Survey of Rajputana has been put on a satisfactory footing by his salary for five years having been sanctioned by the Government of India, and important support having been secured from several of the Rajput States, while two works on the subject will be published very shortly. Our relations with the Numismatic Society have been placed on a good working basis, and three numismatic supplements have been published during the last year, while further important papers are in hand. We have also published extracts of a large number of papers read before the Indian Science Congress. Three lantern lectures were delivered last year, two by Dr. Annandale and one by Babu J. C. Chatterji.

The number of new members just equalled the losses by deaths and resignations, but in addition the Council have had to remove the names of 34 members, who were greatly in arrears with their subscriptions, which accounts for the reduction in our number during the year; the loss being more apparent than real. The annual meeting of Fellows have recommended for election to the fellowship to-night Dr. Simpson, F.R.S., Lt.-Colonel W. D. Sutherland, I.M.S., and Dr. Gravely, who have all done valu-

able work in their respective lines. Death has deprived us of no less than four of our Honorary Fellows—Monsieur Rene Zieller, Sir William Ramsay, Sir Clements Markham, and Sir William Turner; while Dr. Boulenger has been elected to fill one of the vacancies. Before leaving this part of my address I must not omit to mention the excellent work of our Honorary Treasurer, Mr. R. D. Mehta, C.I.E., and our hard-working Honorary Secretary Dr. Gravely, who have borne the burden and heat of the day.

Twenty Years' Research on Kala-Azar.

I have chosen the subject of twenty years' research on kala-azar for the main portion of my address to-night, both because of the great importance of this disease in a large area of India, and on account of the ignorance of the general public regarding it. Most people have fairly definite ideas about malaria and cholera, but few have any regarding the far more deadly and insidious kala-azar, which on account of its extremely high mortality and the painfully lingering nature of the disease, is without doubt the most terrible scourge occurring in India. It is now over twenty years since I was fortunate enough, when with less than three years' service, to be selected to carry out the second investigation of the Assam epidemic of kala-azar, and it has never ceased from that time to occupy my thoughts, although my opportunities for continuing my researches on it, have sometimes been more limited than I should have liked. Fortunately I have been able to discover how to prevent the spread of the disease, and also independently to find a cure for it. The time therefore seems to be ripe for giving a brief popular summary of the progress which has been made in our knowledge of kala-azar through the researches of the last twenty years, which has resulted in a very great degree of success both as regards the prevention and the cure of the disease, although some links in the chain of infection remain to be forged.

In the first place I wish to remove a misconception which I find is commonly prevalent among the public, namely that kala-azar and black-water fever are the same disease or at least intimately related. It is true that some years ago a high medical authority did make such a suggestion on theoretical grounds, but I did not think any medical man now holds that view. As a matter of fact it would be difficult to imagine two more widely different conditions than the lingering kala-azar and the short sharp blackwater fever complication of malaria, which ends in death or recovery within a very few days. I should perhaps mention that some theorists hold that black-water fever is a distinct disease, but most authorities with much practical experience in tropical countries agree that it is but a complication of malaria, with which view I am in agreement

On the other hand, the differentiation of kala-azar from chronic malaria was not possible before the discovery of a distinct parasite in the former, and up to quite recently it remained very difficult on purely clinical grounds in many cases. It is therefore not surprising that the two were for long confused even by research workers, including myself in my report of 1897 on the Assam epidemic and a little later by such a great authority on malaria as Sir Ronald Ross, who proved malaria to be mosquito borne.

The Ravages of Epidemic Kala-Azar in Assam.

It is generally known that kala-azar spread through Assam for a number of years causing a great mortality, but it is difficult to convey to those who have not seen its effects anything like an adequate idea of the terrible nature of the affliction. I show you a map the shaded portions of which were more than decimated by the disease, while the figures indicate the years in which different places and districts were invaded by the epidemic. The deeply shaded area between the Brahmaputra river on the north, and the Garo and Khasia Hills on the south including the Garo Hills, the southern portion of the Goalpara and Kamrup districts, and the whole of the sorely afflicted Nowgong, lost about one-third of their entire population from kala-azar, which spread about ten miles a year along the Grand Trunk Road, which forms the main line of communication. The more lightly shaded parts north of the Brahmaputra were much less affected, communication with them being mainly by steamer across the river. At the time of my investigation in 1896-97 the disease was at its height in the Nowgong district, the population of which in the decade 1891-1901 actually showed a decrease of 31·5 per cent against an increase of 9 to 16 per cent in the more easterly unaffected districts. Large areas of land fell out of cultivation, and even at the headquarters town of Nowgong land absolutely lost its value, being quite unsaleable. When the tea gardens became infected in this district and accurate figures were available, it was found that the mortality in several hundred carefully treated cases varied from 90 to 96 per cent. When I add that the unfortunate patients suffered from fever with little intermission for on the average nine months, during which they were a burden on their relatives, and that I have seen the last of thirteen children in a single family, all the rest having died of the disease, you may be able to form some faint idea of the havoc wrought by such an epidemic in the course of its spread through two hundred and fifty miles of country during a period of twenty-five years. In the Mangaldai district, where I closely investigated the spread of the disease, I frequently met with square patches of jungle in the midst of cultivated rice fields, and on inquiry found that they had belonged to a family which had

recently been wiped out by the epidemic, no one being left to cultivate their land. I myself saw an unfortunate girl, who shortly after her marriage into a village not yet affected by the disease, showed signs of kala-azar, in consequence of which she was made to live in a grass hut outside the village, where her food was brought to her: so great was the dread of the infection being introduced. The Garos also segregated patients in this way, and I was told that occasionally if they took too long to die they were made comatose with drink and their huts burned over their heads: an effective, but scarcely humane, method of sterilizing the infective agent. But I must pass on to show you some photos of cases taken during my investigation. The first group was taken in the Nowgong, and the second in the Mangaldai dispensary. Both show the great emaciation contrasting with the tumid abdomen due to great enlargement of the spleen and often also of the liver, while the skin becomes darker and more muddy, which according to some gave rise to the term kala-azar or black fever. Now it will no doubt occur to many of you that you have seen precisely similar cases in malarious areas around Calcutta, and you will ask how do you differentiate between kala-azar and chronic malaria? That indeed was the problem which confronted me in Assam, with the added difficulty that the disease was spreading and causing an awful mortality such as malaria was not known to do in Lower Bengal, and that the people themselves had no doubt that the disease was an infectious one, which malaria was not believed to be at the time of my investigation, which of course was several years before the mosquito-borne theory of malaria was established. In fact there were at the time two rival theories regarding kala-azar—one that the disease was malarial therefore it could not be infectious, and the other that it was infectious and therefore it could not be malarial so must be some undescribed disease.

I first set to work to find out if kala-azar was infectious, and in the cold season I tramped 130 miles in ten days from village to village by paths and across dried-up rice fields in an area where the disease was still spreading making inquiries. I found that the disease always began in a village through an infected person coming to reside there, the next to be attacked being those living in the same house with the infected visitor. If time sufficed I could give many graphic instances proving infection in this way, but can only state that the evidence was conclusive that the disease was communicable in some way, the infection being usually a house one. This naturally led me to suspect that the disease was not malarial, yet I frequently found malarial parasites in their blood (it was not then known that in malarious parts many apparently healthy persons harbour malarial organisms in their blood), and search as I could, I could

find no differentiating point from malaria. I therefore visited Sylhet to the south of the Khasia Hills, where kala-azar was then unknown, and there found cases of malarial cachexia which in every respect, including investigations of the blood changes, resembled kala-azar of the Brahmaputra Valley, except that they were much more chronic, and sometimes lasted as many years as epidemic kala-azar did months. The next picture shows two such chronic cases in Sylhet. With the boldness of comparative youth I therefore declared the spreading kala-azar of Assam to be an epidemic infectious form of malaria, corresponding in some respects to the well-known Mauritius malarial epidemic in 1877. We shall see presently that I was partly wrong and partly right in coming to this conclusion.

The Prevention of the Spread of Kala-Azar.

However, I was not content with merely theoretical considerations, but strove for practical results from my inquiries, and I early realized the great practical importance of finding out as much as possible regarding the spread of the disease in order to obtain a basis for preventative measures. Among other things I learned that the Garos after bitter experience hit upon the plan of evacuating infected villages and moving to new sites, apparently with good results. I therefore sought for more accurate data on the tea gardens which had become badly infected in the Nowgong district, and on which I investigated many cases with the help of my friend Dr. Dodds Price, who has a unique experience of kala-azar, and has rendered me the greatest possible assistance throughout a number of years. I ascertained that on one of his gardens so many deaths had occurred from kala-azar that 200 new coolies had to be imported at one time. He had already independently recognized the infectiousness of the disease before I went to Assam, and had arranged for separate cooly lines to be built to prevent as many as possible of the new coolies going into the infected houses of the old lines. Only 150 could be accommodated in the new lines so fifty had to go into the old ones. On learning this I at once set to work to ascertain the results of this important measure, and we found that in the course of two years no single case of kala-azar had occurred in the new lines (and the same was true eighteen years later), while no less than 16 per cent of the new coolies living in the old infected lines were already dead of the disease, although the two sites were only about two hundred yards apart. This experience led me to urge moving out all the healthy people from the infected lines into new ones, taking none from infected houses, segregating the remaining infected families and destroying the old houses. The results were so successful that the plan was repeated by Dr. Dodds Price on other gardens, and in 1913 during a visit to Assam in the Puja vacation we worked out the results of

eighteen years' experience. This may briefly be summarised by saying that the dread disease had been completely stamped out of ten coolies' lines, in one of which three-fifths of the whole population previously had the disease in their households, while the new lines had subsequently remained free from the disease in every case, namely for from 12 to 18 years in five of them and for shorter periods in the others, no recurrence having ever taken place where Dr. Price had been able to get his orders carried out by the garden managers to prevent any infected person being allowed to go to live in the new lines. That this success was not due to the decline of the disease in the Nowgong district was clear from the fact that on two gardens where he could not get the managers to adopt my measures the disease was still present at the time of my 1913 visit, having persisted on them for twenty years. I am glad to say that as a result of the publication of our results within the last two years the disease has been completely removed from these two plague spots, and recently Dr. Price was unable to obtain a single case in which to try a new treatment I had suggested to him. When it is stated that the population of the new kala-azar free lines in 1913 amounted to 6,727 souls, and that the deaths from kala-azar alone in the old lines before removal had amounted to 1,393 or no less than 207 per mille, over one-fifth, that the loss would have continued indefinitely, as shown by the fact that the disease remained present for twenty years on two gardens where the plans were not adopted, and that coolies cost about Rs. 200 a head to recruit by the time they reach Assam, the saving to the tea industry in this one district alone must have amounted to lakhs of rupees. I am glad to be able to say that the industry has shown its gratitude in a very practical way by promising Rs. 20,000 a year for five years for investigations in connection with the School of Tropical Medicine.

The more difficult question remained as to whether anything could be done to check the spread of the disease up the Brahmaputra Valley. On turning once more to the map you will see that the Nowgong district is bounded on the east by the sparsely populated Mikir Hills with no roads through them, and the only traffic eastward is along the narrow strip between these hills and the Brahmaputra River, which also has comparatively few inhabitants. I found it to be free from kala-azar in 1897, so recommended that steps should be taken to stop infected people from passing up into the Golaghat subdivision of the Sibsagar district, and that if any villages became infected in Golaghat the segregation measures should at once be carried out, and the healthy people moved to a new site. This was actually done later with success, and as the epidemic has abated in Nowgong although sporadic cases remain, there is good reason to hope that the main danger has been averted.

and the eastern part of the valley saved from devastation little if at all less disastrous than war itself. A recent investigation by Major McCombie Young, Sanitary Commissioner, Assam, has showed that the disease remains in a sporadic form in just those parts of Assam which I found to be infected with the epidemic twenty years ago: an important point I shall return to presently. Before leaving this part of the subject let me emphasize the fact that all the above practically important prophylactic measures were worked out as a result of my epidemiological studies before we had any accurate knowledge of the true nature and causation of the disease, so that however wrong my theories proved to be, I have the satisfaction of knowing that my earliest important investigation in India led to much saving of life and suffering, which has always been a greater satisfaction to me than in making purely scientific discoveries without much practical value.

The Discovery of the Parasite of Kala-Azar and of its Life-History.

In the meanwhile my theory that kala-azar was an epidemic malaria, although supported by the high authority of Sir Ronald Ross, was criticized by others, and Dr. Bentley, on the strength of what ultimately proved to be erroneous blood tests made at Kasauli, declared the disease to be an epidemic of Malta fever, but at the same time he brought forward some strong arguments against the disease being malarial. While opinions were thus divided in India researches on two other continents led to a solution of the difficult problem; so closely is scientific thought all over the world united by medical literature at the present day. In Africa the late Dr. Dutton, the most brilliant worker yet produced by the Liverpool School of Tropical Medicine, discovered a human trypanosome in the blood of a patient suffering from a fever, which was later proved by Sir David Bruce to be the early stage of the deadly sleeping sickness. Sir William Leishman then recorded having found some minute bodies in the spleen of a soldier who died in England of a fever contracted in Dum Dum, and suggested that they were degenerate trypanosomes. Lt.-Colonel C. Donovan, I.M.S., of the Madras Medical College, immediately announced that he had independently found the same bodies some months before, and added the important fact that they could be obtained by spleen puncture during life, thus disproving Leishman's theory that they were degenerate trypanosomes. Donovan also suggested that the so-called malarial cachexia and kala-azar might also be due to this parasite. Leishman and Donovan were therefore the joint discoverers of the parasite of kala-azar which is called after them, and I am glad to say that the Asiatic Society has been the first to recognize the importance of Donovan's work by electing him to our fellow-

ship last year, although it is but a small recognition of such an important discovery. The way was now cleared for more rapid advance, and Dr. Bentley and myself independently found the same parasite in epidemic kala-azar in Assam, and I also found them in cases in the north-west of the Dinajpur district, where the disease had been known as kala-dukh. Thanks to the kindness of the Physicians of the Medical College Hospital in 1904-05, and especially to Surgeon-General Harris, I was able to investigate scores of cases of what had hitherto been always regarded as malarial cachexia, with the result of showing that a large proportion of them were kala-azar. These observations established the important fact that a sporadic form of kala-azar is widely prevalent in Lower Bengal, which I found to be exactly similar to the cases I had formerly studied in Sylhet, of which I have shown you a photo. The mystery of the nature of kala-azar was thus cleared up, the destructive Brahmaputra Valley wave having been an epidemic form of the disease which is endemic in Lower Bengal and Sylhet; so that although I was wrong in regarding it as malarial, I was correct in saying it was an epidemic variety of the disease I found in Sylhet, which had always been regarded as malarial cachexia, but which we now know to be sporadic kala-azar. As special skill and laboratory facilities are required for demonstrating the parasite of kala-azar, while the treatment of the disease is different from that of chronic malaria, it still remained a matter of great practical importance to solve the century-old problem of finding a simple clinical differentiation between kala-azar and malarial cachexia. Only last month I recorded the results of three years' investigation of this problem in the Medical College Hospital, thanks to facilities kindly afforded me by my medical colleagues, which has, I believe, resulted in a simple and practical solution of this difficulty, which will enable the curative treatment I shall come to presently, being successfully used by the general practitioner even in places remote from laboratories.

The discovery of the parasite of kala-azar in 1903 placed us in a position to study it with a view to ascertaining its life-history, and so to obtain a clue to the mode of infection. In the following year I was fortunate enough to succeed in cultivating this protozoal parasite in test tubes under certain conditions, and in watching the minute spleen form develop into a long flagellate organism resembling one of the stages of a trypanosome, but which further study showed to belong to the closely allied herpetomonas. The next picture illustrates the stages of the development. This discovery gave the required clue to the nature and probably life-history of the parasite, as similar organisms are found naturally in the digestive canals of certain flies, indicating that the infection is probably insect borne. I spent the next year in studying the conditions favour-

able to the growth of the parasite in cultures, and for reasons which I have not time to go into, I came to the conclusion that the homely bed bug is the carrier of the disease. The fact which had by this time been established by Dr. Dodds Price that two to four hundred yards is a sufficient distance to remove healthy lines from infected ones is sufficient to exclude a flying insect such as a mosquito. I next took privilege leave to Assam to search for the development of the parasite in bed bugs from kala-azar infected houses, but only strained my eyes without obtaining any positive results. At this time Major Patton, I.M.S., of the Bacteriological Department, was placed on special duty to work at the subject in Madras, and recognizing that professorial duties do not leave sufficient time for such an investigation, I gladly left the field open to him. After some two years' work he obtained development of the parasite up to the flagellate stage in the digestive canal of bed bugs fed on kala-azar patients with the parasites in their blood. Lt.-Colonel Cornwall, I.M.S., has recently confirmed these experiments, and although the final proof of communicating the disease by means of infected bed bugs has not yet been furnished (experiment on human beings, such as were carried out in the case of malaria, not being justifiable in the deadly kala-azar), still the evidence incriminating these insects is sufficiently weighty to make it desirable to wage war upon them wherever the disease is present. Coconut oil applied to the runs of the bugs on walls and to the buttons of mattresses, etc., where they often hide, is a useful measure for this purpose. As these insects can live for months without food, the way in which the infection clings to houses is well explained on my theory that they are the carriers of the disease.

The Cure of Kala-Azar.

Lastly I come to the most important discovery regarding kala-azar, namely that of a reliable cure of this formerly very deadly disease. The fact that cases in an extremely advanced stage of emaciation occasionally take a sudden turn for the better and eventually completely recover their health, early led me to feel morally certain that some day a curative treatment would be discovered, and I have never ceased to search for such a method, although through having no hospital beds I have been greatly handicapped in this part of my work. Fortunately Surgeon-General Harris, more especially at the Medical College, and a long succession of Resident Surgeons at the European General Hospital as well as my old friend Dr. Dodds Price, have from time to time been kind enough to allow me to try various remedies which are too numerous to mention. Moreover, in the case of the closely parallel human trypanosomiasis, including sleeping sickness of Africa, laboratory animals are easily infected, and many remedies have been found to have more or less power to destroy the trypanosomes in their blood. I

have long thought that if a cure was discovered for trypanosomiasis it would very probably be also effective in kala-azar, and consequently have carefully watched for some years the work on the African disease. At first arsenical preparations promised well, but they proved to be either too toxic or too temporary in their effects, and they have also failed in kala-azar. More recently antimony preparations have proved to be of value in trypanosomiasis, and nearly two and a half years ago I decided to try intravenous injections of tartar emetic in kala-azar. Unfortunately just at that moment I had no clinical facilities for testing my idea, and for six months I carried about sterile capsules of tartar emetic without being able to use them, a disability which will end when the Carmichael Hospital for Tropical Diseases is opened. Eventually I obtained the facilities I required, and soon saw reason to believe that the drug was proving effective. Imagine my disappointment when I read that two Italian doctors had recorded successes in the treatment of the African form of kala-azar with the very drug I was using in Calcutta, although the fact that I had independently discovered the treatment will save some of the credit for the Indian Medical Service. At any rate I am now in the happy position of being able to say that, thanks to the kind help of Captain N. H. Hume and Lt.-Colonel O'Kinealy, no less than twenty-five consecutive cases of kala-azar, including three children, have been successfully treated in the European General Hospital by my method, and the most deadly common disease of India, if not of the world, has now been largely conquered both as regards prevention and cure, perhaps more completely than any other highly lethal disease known, as a direct result of the researches of the last twenty years.

In conclusion I cannot resist this opportunity of pointing the moral, namely that no greater benefit can arise than from successful medical research, and that no better use can be made of wealth than in endowing such research for the benefit of the present and all future generations. Bengal, and I would add Bihar, have already nobly responded to my appeal for endowments for the Calcutta School of Tropical Medicine, and when the terrible war is over we hope to have at least nine research workers in the new laboratories, instead of one poor man with routine professorial duties devoting such time as he can snatch to medical research.



The President announced the election of Officers and Members of Council for the year 1917 to be as follow :—

President :

H. H. Hayden, Esq., C.I.E., D.Sc., B.A., B.A.I., F.G.S.,
F.A.S.B., F.R.S.

Vice-Presidents :

Lieut.-Col. Sir Leonard Rogers, Kt., C.I.E., M.D., B.S.,
F.R.C.P., F.R.C.S., F.A.S.B., F.R.S., I.M.S.
Mahamahopadhyaya Haraprasad Shastri, C.I.E., M.A.,
F.A.S.B.
N. Annandale, Esq., D.Sc., C.M.Z.S., F.L.S., F.A.S.B.
The Hon'ble Justice Sir J. G. Woodroffe, Kt., M.A., B.C.I.

Secretary and Treasurer :

General Secretary :—F. H. Gravely, Esq., D.Sc.
Treasurer :—R. D. Mehta, Esq., C.I.E., F.R.S.A.

Additional Secretaries :

Philological Secretary :—A. Al-Ma'mun Suhrawardy, Esq.,
Iftikharul Millat, M.A., Ph.D., Bar.-at-Law.
Natural History Secretaries :—

{	Biology :—H. G. Carter, Esq., M.B.,
	Ch B.
	Physical Science :—P. J. Bruhl, Esq.,

D.Sc., F.A.S.B.
Anthropological Secretary :—N. Annandale, Esq., D.Sc.,
C.M.Z.S., F.L.S., F.A.S.B.
Joint Philological Secretary :—Mahamahopadhyaya Satis
Chandra Vidyabhusana, M.A., Ph.D., F.A.S.B.
Medical Secretary :—W. C. Hossack, Esq., M.D., D.P.H.
Honorary Librarian :—The Hon'ble Justice Sir Asutosh
Mukhopadhyaya, Kt., C.S.I., D.L., D.Sc., F.R.S.E.,
F.R.A.S., F.A.S.B.

Other Members of Council :

C. S. Middlemiss, Esq., B.A., F.G.S., F.A.S.B.
Major D. McCay, M.B., I.M.S.
The Hon'ble Mr. F. J. Monahan, I.C.S.
P. C. Ray, Esq., C.I.E., D.Sc.
A. H. Harley, Esq., M.A.
H. G., Graves, Esq., A.R.S.M.
S. W. Kemp, Esq., B.A., F.A.S.B.

The President also announced the election of Fellows to be
as follows :—

G. C. Simpson, Esq., D.Sc., F.R.S.
Lieut.-Col. W. D. Sutherland, M.D., I.M.S.
F. H. Gravely, Esq., D.Sc.

The meeting was then resolved into the Ordinary General
meeting.

The following persons were balloted for as Ordinary
Members :—

Miss Refina Guha, B.A., B.L., 9, Marquis Street, proposed
by the Hon'ble Justice Sir Asutosh Mukhopadhyaya, Kt.,

seconded by Dr. A. Suhrawardy; Babu Jamini Kanta Biswas, Zemindar, Cuttack, proposed by Kashinath Das, seconded by Dr. Satis Chandra Vidyabhusana.

The General Secretary reported the death of Rai Sarat Chandra Das, Bahadur, an Associate Member; and of Dr. R. A. Barker, F.G.S. a Life-member of the Society.

The President announced that the following six members being largely in arrears of subscriptions had been declared defaulters and that their names would be posted up in accordance with Rule 38 :—

Maulavi Aminulla, Ghazipur.
Babu Debendra Kumar Banerjee, Dacca.
C. H. Hutchinson, Esq., Pusa.
S. M. Jacob, Esq., Bombay.
Babu Munan Dube, Domardagunj.
Babu Lachmi Narain Singh, Bankipur.

The President called attention to the following exhibitions :—

1. Two old copper-gilt Buddhist figures of Tara and Vajra-Sattva. Hon'ble Justice Sir J. G. Woodroffe.
2. Two Buddhist Temple Banners of the beginning of the XIX Century, and two dated Nepalese Statuettes of the XVIII Century. Mr. E. Vredenburg and Dr. Satis Chandra Vidyabhusana.
3. Arabic and Persian Manuscripts and Moslem Antiquities. Dr. A. Suhrawardy.
4. Some recently discovered coins belonging to Mr. P. N. Tagore. R. D. Banerji.
5. The first volume of the Philosophical Transactions of the Royal Society, original edition published in 1665. Honorary Librarian.
6. The Opera Chirurgica of Ambrose Pary, 1594. Dr. N. Annandale.
7. Some specimens of early printing in India. Rev. H. Hosten, S.J.
8. Drawings and photographs of cases of Leprosy and Kala-Azar. Lieut.-Col. Sir Leonard Rogers, Kt.
9. Some Indian Medicinal plants of the order Solenaceae. Dr. H. G. Carter.
10. Intermediate hosts of human parasites from Japan. Dr. N. Annandale.
11. Fairy shrimps (Phyllopoda) from Aden. S. W. Kemp.
12. Specimens and photographs of spiders. W. H. Phelps.

13. A set of minerals such as are of special interest in connection with the War. The Geological Survey of India.
14. New Indian Meteorites The Geological Survey of India.
15. Some cyclone records. C. W. Peake.

The President announced that there would be no meeting of the Medical Section during this month.

LIST OF MEMBERS
OF THE
ASIATIC SOCIETY OF BENGAL.

ON THE 31ST DECEMBER, 1916.

LIST OF OFFICERS AND MEMBERS OF COUNCIL
OF THE ASIATIC SOCIETY OF BENGAL
FOR THE YEAR 1916.

President :

Lieutenant-Colonel Sir Leonard Rogers, Kt., C.I.E., M.D.,
B.S., F.R.C.P., F.R.C.S., F.A.S.B., F.R.S., I.M.S.

Vice-Presidents :

The Hon'ble Justice Sir Asutosh Mukhopādhyāya, Kt., C.S.I.,
D.L., D.Sc., F.R.S.E., F.R.A.S., F.A.S.B.
Mahāmahopādhyāya Haraprasād Sāstri, C.I.E., M.A.,
F.A.S.B.
H. H. Hayden, Esq., C.I.E., D.Sc., B.A., B.E., B.A.I., F.G.S.,
F.A.S.B., F.R.S.
N. Annandale, Esq., D.Sc., C.M.Z.S., F.L.S., F.A.S.B.

Honorary Secretary and Treasurer.

General Secretary :—F. H. Gravely, Esq., D.Sc.
Treasurer :—R. D. Mehta, Esq., C.I.E.

Additional Secretaries.

Philological Secretary :—A. Al-ma'mūn Suhrawardy, Esq.,
Iftikharul Millat, M.A., D.Litt., LL.D., Bar.-at-law.
Natural History { Biology :—P. J. Brühl, Esq., D.Sc.,
 F.A.S.B.
Secretaries. { Physical Science :—P. J. Brühl, Esq.,
 D.Sc., F.A.S.B.
Anthropological Secretary :—N. Annandale, Esq., D.Sc.,
C.M.Z.S., F.L.S., F.A.S.B.
Joint Philological Secretary :—Mahāmahopādhyāya Satīs
Chandra Vidyābhūṣana, M.A., Ph.D., F.A.S.B.
Medical Secretary :—W. C. Hossack, Esq., M.D., D.P.H.
Honorary Librarian :—S. W. Kemp, Esq., B.A., F.A.S.B.

Other Members of Council.

C. S. Middlemiss, Esq., B.A., F.G.S., F.A.S.B.
Major D. McCay, M.D., I.M.S.
The Hon'ble Justice Sir J. G. Woodroffe, Kt., M.A., B.C.L.
The Hon'ble Mr. F. J. Monahan, I.C.S.
C. J. Hamilton, Esq.
C. W. Peake, Esq., M.A.

LIST OF ORDINARY MEMBERS.

R. = Resident. N.R. = Non-Resident. A. = Absent. L.M. = Life Member.
F.M. = Foreign Member.

An Asterisk is prefixed to the names of the Fellows of the Society.

N.B.—Members who have changed their residence since the list was drawn up are requested to give intimation of such a change to the Honorary General Secretary, in order that the necessary alteration may be made in the subsequent edition. Errors or omissions in the following list should also be communicated to the Honorary General Secretary.

Members who are about to leave India and do not intend to return are particularly requested to notify to the Honorary General Secretary whether it is their desire to continue Members of the Society; otherwise, in accordance with Rule 40 of the rules, their names will be removed from the list at the expiration of three years from the time of their leaving India.

Date of Election.		
1907 April 3.	N.R.	Abdul Ali, Abul Faiz Muhammad, M.A., Deputy Magistrate. <i>Netrokona, Mymensingh.</i>
1909 Mar. 3.	N.R.	Abdul Latif, Syed, Deputy Magistrate. <i>Patuakhai, Backerganj.</i>
1894 Sept. 27.	L.M.	Abdul Wali, Maulavi. 23, <i>European Asylum Lane, Calcutta.</i>
1912 Aug. 7.	N.R.	Abdulla-ul-Musawy, Syed, B.A., Zemindar. <i>Bohar, Burdwan.</i>
1915 Feb. 3.	N.R.	Ahmad Ali Khan, Maulavi Hafiz, Superintendent, Rampur State Library. <i>Rampur.</i>
1911 April 5.	N.R.	Ahmad Husain, Nawab, Khan Bahadur. <i>Rais of Pargawan, Partabgarh, Dist. Oudh.</i>
1903 Oct. 28.	R.	Allan, Alexander Smith, M.B. 17 & 18, <i>Esplanade Mansions, Calcutta.</i>
1913 Nov. 5.	N.R.	Aminullah, Maulvi, Pleader. <i>Ghazipore.</i>
1914 April 1.	N.R.	Amir Ahmad Ansari, B.A. <i>Begum Cothee, Meerut, U.P.</i>
1893 Aug. 31.	A.	Anderson, Lieut.-Col. Adam Rivers Steele, B.A., M.B., D.P.H., C.M.Z.S., I.M.S. <i>Europe (c/o India Office).</i>
1912 July 3.	N.R.	Andrews, Egbert Arthur, B.A. <i>Tooklai Experimental Station, Cinnenara P.O., Jorhat, Assam.</i>
1916 Feb. 2.	R.	Andrews, W. C., B.A. (Oxon). 11, <i>Loudon Street, Calcutta.</i>
1904 Sept. 28.	R.	*Annandale, Nelson, D.Sc., C.M.Z.S., F.A.S.B., Director, Zoological Survey of India. <i>Calcutta.</i>

Date of Election.		
1910 April 6.	N.R.	Ascoli, Frank David, I.C.S. <i>Dacca.</i>
1911 May 3.	R.	Atkinson, Albert Charles. <i>La Martiniere College, Calcutta.</i>
1904 July 6.	N.R.	Aulad Hasan, Sayid, <i>Khan Bahadur. Dacca.</i>
1914 Mar. 4.	L.M.	Bağot, Mons. I. 31, <i>Quai d'Orsay, Paris.</i>
1870 Feb. 2.	L.M.	Baden-Powell, Baden Henry, M.A., C.I.E. <i>Ferlys Lodge, 29, Banbury Road, Oxford, England.</i>
1891 Mar. 4.	F.M.	Baillie, The Hon. Sir Duncan Colvin, K.C.S.I., I.C.S. 9, <i>Pall Mall, London.</i>
1909 Feb. 3.	N.R.	Banerji, Charu Deb, B.A., LL.B. <i>Allahabad.</i>
1910 Dec. 7.	N.R.	Banerji, Devendra Kumar. <i>Dacca College, Dacca.</i>
1905 Mar. 1.	R.	Banerji, Muralidhar. <i>Sanskrit College, Calcutta.</i>
1907 Jan. 2.	R.	Banerji, Rakhal Das, M.A. 45/4, <i>Simla Street, Calcutta.</i>
1885 Nov. 4.	R.	Barman, Damodar Das. 55, <i>Clive Street, Calcutta.</i>
1898 Mar. 2.	N.R.	Barnes, Herbert Charles, M.A., I.C.S., Deputy Commissioner, <i>Naga Hills. Kohima, Assam.</i>
1908 Nov. 4.	N.R.	Barnes, James Hector, B.Sc., F.I.C., F.C.S., Principal, <i>Punjab Agricultural College. Lyallpur.</i>
1916 Sept. 27.	R.	Basdekas, Rev. Hilarion, Curate of the Greek Church. 2, <i>Outram Street, Calcutta.</i>
1909 July 7.	N.R.	Bazuz, Rangnath Khunraj. <i>Girgaon, Bombay.</i>
1895 July 3.	L.M.	Beatson-Bell, The Hon. Mr. Nicholas Dodd, B.A., C.I.E., I.C.S. 4, <i>Elysium Row, Calcutta.</i>
1907 Feb. 6.	N.R.	Bell, Charles Alfred, I.C.S. <i>Gangtok, Sikkim.</i>
1915 April 7.	N.R.	Belvalkar, Sripad Krishna, M.A., Ph.D., Prof. of Sanskrit, <i>Deccan College. Poona.</i>
1909 April 7.	R.	Bentley, Charles A., M.B., D.P.H. <i>Writers' Building, Calcutta.</i>
1876 Nov. 15.	F.M.	*Beveridge, Henry, F.A.S.E., I.C.S. (retired). <i>Pitfold, Shottermill, Haslemere, Surrey, England.</i>
1908 Nov. 4.	N.R.	Bhattacharji, Bisvesvar, Deputy Magistrate, <i>Krishnagar. Nadia.</i>
1909 July 7.	R.	Bhattacharji, Shib Nath, M.B. 17, <i>Mohanbagan Road, Calcutta.</i>
1914 Nov. 4.	N.R.	Bhattacharji, Vireshwar. <i>Navadvipa.</i>
1910 May 4.	A.	Bishop, T. H., M.R.C.S., L.R.C.S., D.P.H. <i>Europe.</i>
1893 Feb. 1.	L.M.	Bodding, Revd. P. O. <i>Dumka, Sonthal Parganas. [cutta].</i>
1912 Oct. 30.	A.	Bolton, H. O. (c/o Messrs. Graham & Co., <i>Cal-</i>
1912 July 3.	N.R.	Bomford, Capt. Trevor Lawrence, I.M.S., M.B., B.S., M.R.C.S., L.R.C.P. (c/o Rev. T. Bomford, <i>C.M.S. House, Peshawar.</i>)

Date of Election.		
1898 Feb. 2.	R.	Bose, Amrita Lal, Dramatist. 9-2, <i>Ram Chandra Maitra's Lane, Calcutta.</i>
1908 June 3.	R.	Bose, Hira Lal, <i>Dewan Bahadur</i> , L.M.S. 10, <i>Creek Lane, Calcutta.</i>
1895 Mar. 6.	R.	*Bose, Jagadis Chandra, C.S.I., M.A., D.Sc., C.I.E., F.A.S.B. <i>Presidency College, Calcutta.</i>
1914 Nov. 4.	N.R.	Bose, Thakur Birendranath. <i>Dacca.</i>
1910 July 6.	N.R.	Botham, Arthur William, I.C.S. <i>Shillong.</i>
1911 Nov. 1.	N.R.	Boyle, Lieut. Cecil Alexander, 11th King Edward's Lancers, Cavalry Lines, S. Warristan Militia. <i>Wano, Warristan, N.W.F.P.</i>
1908 Jan. 1.	R.	Brahmachari, Upendra Nath, M.A., M.D. 19, <i>Grey Street, Calcutta.</i>
1913 Aug. 6.	N.R.	Brown, C. J. <i>Canning College, Lucknow.</i>
1906 July 4.	R.	Brown, Lieut.-Col. Edwin Harold, M.D., I.M.S. (retired). 4, <i>Harrington Street, Calcutta.</i>
1907 July 3.	N.R.	Brown, John Coggin, M.Sc., F.G.S., F.C.S. (<i>c/o Geological Survey of India, Calcutta.</i>).
1909 Oct. 6.	R.	Brown, Percy, A.R.C.A. <i>Government School of Art, Calcutta.</i>
1909 Oct. 6.	R.	*Brühl, Paul Johannes, Ph.D., F.C.S., F.A.S.B. 4, <i>Humayun Place, Calcutta.</i>
1901 June 5.	F.M.	*Burkill, Isaac Henry, M.A., F.A.S.B. <i>Botanical Gardens, Singapur.</i>
1896 Jan. 8.	N.R.	*Burn, The Hon. Mr. Richard, C.I.E., I.C.S. F.A.S.B., Chief Secretary to the Government of United Provinces. <i>Allahabad.</i>
1913 Jan. 1.	N.R.	Burrard, Col. Sir S. G., K.C.S.I., C.S.I., F.R.S., Surveyor General of India. <i>Dehra Dun.</i>
1900 May 2.	N. R.	Butcher, Flora, M.D. <i>Tanakpur, R. & K. Railway, Pilibhit District.</i>
1913 Apl. 2.	R.	Calder, Charles Cumming. <i>Royal Botanic Gardens, Sibpur, Howrah.</i>
1907 Apl. 3.	R.	Calvert, Lieut.-Col. John Telfer, M.B., M.R.C.P., I.M.S. <i>Medical College, Calcutta.</i>
1901 Mar. 6.	N.R.	Campbell, William Edgar Marmaduke, I.C.S. <i>Pilibhit, U.P.</i>
1895 July 3.	A.	Carlyle, Sir Robert Warrand, K.C.S.I., C.I.E., I.C.S. <i>Europe (c/o India Office).</i>
1912 Mar. 6.	R.	Carmichael, His Excellency the Right Hon'ble Thomas David, Baron of Skirling, G.C.I.E., K.C.M.G., Governor of Bengal. <i>Calcutta.</i>
1915 Jany. 6	R.	Carter, Humphry G., Economic Botanist to the Botanical Survey, Indian Museum. 27, <i>Chowringhee Road, Calcutta.</i>
1910 May 4.	A.	Carter, Capt. Robert Markham, I.M.S. <i>Europe (c/o India Office).</i>
1905 May 3.	R.	Chakravarti, Dwarkanath, M.A., B.L., Vakil High Court. <i>Calcutta.</i>

Date of Election.			
1890 June 4.	N.R.	*Chakravarti, Rai Monmohan, Bahadur, M.A., B.L., F.A.S.B.	<i>Comilla, Tipperah.</i>
1909 Mar. 3.	R.	Chakravarti, Nilmani, M.A.	<i>Presidency College, Calcutta.</i>
1905 July 5.	N.R.	Chakravarti, Vanamali.	<i>Cotton College, Gauhati.</i>
1906 Jan. 3.	R.	Chapman, John Alexander, Librarian, Imperial Library.	<i>Calcutta.</i>
1895 Oct. 27.	F.M.	Chatterjee, Atul Chandra, I.C.S., Royal Society's Club.	<i>St. James' St., London, S.W.</i>
1908 Feb. 5.	R.	Chatterjee, Gopal Chandra, M.B.	<i>Medical College, Calcutta.</i>
1911 June 7.	R.	Chatterjee, Karuna Kumar, F.R.C.S.	74, <i>Dharamtola Street, Calcutta.</i>
1916 Jan. 5.	R.	Chatterjee, Khagendra Nath, B.A., B.L., Attorney-at-Law.	12, <i>Madan Mohan Chatterjee Lane, Calcutta.</i>
1907 Sept. 25.	R.	Chatterjee, Promode Prakas.	8, <i>Dixon Lane, Calcutta.</i>
1893 Sept. 28.	R.	Chaudhuri, B. L., B.A., D.Sc. (Edin.), F.R.S.E., F.L.S. (Lond.).	120, <i>Lower Circular Road, Calcutta.</i>
1911 Mar. 1.	N.R.	Chaudhuri, Charu Chandra, Rai Bahadur, Zemindar, Sherpur Town.	<i>Mymensingh Dist.</i>
1914 April 1.	R.	Chaudhuri, Gopal Das.	32, <i>Beadon Row, Calcutta.</i>
1913 June 4.	R.	Chaudhuri, P., Bar.-at-Law.	2, <i>Bright Street, Ballygunge, Calcutta.</i>
1907 July 3.	F.M.	Christie, William Alexander Kynock, B.Sc., Ph.D.	<i>Europe (c/o Geological Survey of India, Calcutta).</i>
1909 Nov. 3.	N.R.	*Christophers, Major Samuel Richmond, M.B., F.A.S.B., I.M.S., Mesopotamia Field Force, c/o Postmaster General, Bombay.	
1906 Nov. 7.	A.	Clarke, Geoffrey Roth, I.C.S.	<i>Europe (c/o India Office).</i>
1915 Sep. 1.	R.	Cleghorn, Maude Lina West, F.L.S., F.E.S.	5, <i>Alipur Lane, Calcutta.</i>
1908 Nov. 4.	A.	Cook, Capt. Lewis, I.M.S.	<i>Europe (c/o India Office).</i>
1907 July 3.	R.	Cotter, Gerald de Purcell, Assistant Superintendent, Geological Survey of India.	<i>Calcutta.</i>
1908 Jan. 1.	R.	Crake, Dr. Herbert Milverton, Health Officer.	15, <i>Loudon Street, Calcutta.</i>
1876 Mar. 1.	F.M.	Crawfurd, James, B.A., I.C.S. (retired).	<i>Thornwood, Uddington, Lanarkshire, Scotland.</i>
1887 Aug. 25.	R.	Criper, William Risdon, F.C.S., F.I.C., A.R.S.M.	<i>Konnagar, E.I.R.</i>
1895 July 3.	A.	Cumming, John Ghest, C.I.E., I.C.S.	<i>Europe (c/o India Office).</i>

Date of Election.		
1873 Dec. 3.	F.M.	Dames, Mansel Longworth, I.C.S. (retired). <i>Ventnor, Wodeland Road, Guildford, Surrey, England.</i>
1915 Sep. 1	R.	Das-Gupta, Hem Chandra, M.A., F.G.S., Prof., Presidency College, <i>Calcutta.</i>
1896 Mar. 4.	L.M.	Das-Gupta, Jogendra Nath, B.A. (Oxon), Barrister-at-Law. 39, <i>Lower Circular Road, Calcutta.</i>
1916 Dec. 6.	R.	Dasji, Sri Baman, Kaviraj, Ayurvedic and Unani Physician. 152, <i>Harrison Road, Calcutta.</i>
1912 April 3.	N.R.	Das, Kasi Nath, Prof., Ravenshaw College. <i>Cuttack.</i>
1910 Jan. 5.	R.	David, David A. 55, <i>Free School St., Calcutta.</i>
1895 Sept. 19.	N.R.	De, Kiran Chandra, B.A., I.C.S., Commissioner, <i>Chittagong.</i>
1906 Dec. 5.	R.	Deare, Lieut.-Col. Benjamin Hobbs, M.R.C.S. (Eng.), L.R.C.P. (Lond.), D.P.H. (Cantab), I.M.S. 14, <i>Russell Street, Calcutta.</i>
1904 Sept. 28.	N.R.	DeCourcy, William Blennerhasset. <i>Leddlesdale Estate, Naduwatum P.O., Nilgiris.</i>
1912 May 1.	A.	Demetriadi, Stephen. <i>Europe (c/o Ralli Bros., Calcutta).</i>
1906 Dec. 5.	N.R.	Dentith, Arthur William, I.C.S. <i>Shillong.</i>
1916 Dec. 6.	R.	Dharmapala, Anagarika, Secretary, Mohabodhi Society. 4a, <i>College Square, Calcutta.</i>
1910 May 4.	L.M.	Dhavle, Sankara Balaji, I.C.S. <i>Lahiria Surai, Darbhanga.</i>
1912 July 3.	R.	Digby, Everard, B.Sc. (Lond.). 1, <i>Garstin's Place, Calcutta.</i>
1907 Oct. 30.	N.R.	Dixit, Pandit Sri Ram, B.A., <i>Dewan of Banswaru, Rajputana.</i>
1898 Jan. 5.	R.	Dods, William Kane, Agent, Hongkong and Shanghai Banking Corporation. <i>Calcutta.</i>
1909 Nov. 3.	N.R.	*Donovan, Lieut.-Col. Charles, M.D., I.M.S., F.A.S.R. <i>Medical College, Madras.</i>
1902 July 2.	R.	Doxey, Frederick. 9, <i>Queen's Park, Ballygunge, Calcutta.</i>
1909 Aug. 4.	N.R.	Drake-Brockman, Digby Livingstone, I.C.S. <i>Allahabad.</i>
1912 Nov. 6.	N.R.	Dube, Manan. <i>Tahsildar, Domariagunj, Basti.</i>
1912 April 3.	A.	Duff-Sutherland-Dunbar, Capt. Sir George, Bart. <i>Europe (c/o India Office).</i>
1914 Sept. 2.	R.	Dutt, B. C. 172, <i>Manicktola Street, Calcutta.</i>
1916 May 3.	N.R.	Dutt, Dharanidhar, B.A. <i>Nepal.</i>
1877 Aug. 30.	R.	Dutt, Kedar Nath. <i>Prasad Kutir Pitury's Ghat St., Kamarhati P.O.</i>
1910 April 6.	N.R.	Ebdon, Capt. F. T. P. 73rd <i>Carnatic Infantry, Trichinopoly.</i>

Date of Election.		
1910 April 6.	R.	Elmes, Dr. Cecil H. 1, <i>Middleton Row, Calcutta.</i>
1911 Nov. 1.	R.	Esch, V. J., Architect. <i>Victoria Memorial Building, Cathedral Avenue, Maidan Calcutta.</i>
1915 Jany. 6.	N.R.	Fazl-i-Haqq, Q., M.A., Prof. of Persian Literature. <i>Govt. College, Lahore.</i>
1904 Aug. 3.	R.	*Fermor, Lewis Leigh, A.R.S.M., D.Sc., F.G.S., F.A.S.B. Superintendent, Geological Survey of India. <i>Calcutta.</i>
1916 June 7.	R.	Ferrer, Joseph Orlando, Cuban Consul. 5, <i>Hastings St., Calcutta.</i>
1906 Dec. 5.	N.R.	Finck, Herman, H. G., M.D. <i>Ahmednagar.</i>
1906 Oct. 31.	N.R.	Finlow, Robert Steel, Fibre Expert to the Govt. of Assam. <i>Dacca.</i>
1907 Mar. 6.	R.	Firminger, The Ven'ble Walter Kelly, M.A., B.D., F.R.G.S., Archdeacon of Calcutta. <i>St. John's House, Council House Street, Calcutta,</i>
1910 Sept. 7.	A.	Fortescue, Capt. Archer Irvine, R.A.M.C. <i>Europe (c/o Army Dept., Simla).</i>
1913 Nov. 5.	F.M.	Fox, Lieut. Cyril S., Signals 46 Infantry Bde., 15th Division. <i>B.E.F., France.</i>
1910 April 6.	N.R.	Francis, Lieut. Reginald Frankland, Indian Army. <i>Jullunder, Punjab.</i>
1903 Mar. 4.	R.	*Gage, Major Andrew Thomas, M.A., M.B., B.Sc., F.L.S., I.M.S. <i>Royal Bot. Gardens, Calcutta.</i>
1893 Jan. 11.	N.R.	*Gait, His Honour Sir Edward Albert, K.C.S.I., C.S.I., C.I.E., I.C.S., Lieutenant-Governor of Bihar and Orissa. <i>Ranchi.</i>
1912 Mar. 6.	R.	Ganguli, Manmohan, B.E. District Engineer. <i>Mirzapur Street, Calcutta.</i>
1909 Oct. 7.	R.	Ganguli, Ordhendhu Kumar. 12, <i>Ganguli's Lane, Calcutta.</i>
1908 Feb. 5.	N.R.	Gardner-Brown, John Gerald Gardner, M.A., Director, State Education. <i>Holkar College, Indore.</i>
1916 May 3.	A.	Geuns, M. Van. <i>Europe.</i>
1905 July 5.	R.	Ghosh, Amulya Charan, <i>Vidyabhusana. 82, Manicktolla Street, Calcutta.</i>
1912 Aug. 7.	R.	Ghosh, Atal Behari, M.A., B.L. 59, <i>Sukea Street, Calcutta.</i>
1907 Oct. 30.	R.	Ghosh, Birendra Nath, L.M.S., Medical Practitioner. 109, <i>College Street, Calcutta.</i>
1912 Mar. 6.	R.	Ghosh, Harinath, M.D., Assistant Surgeon. 15/1a, <i>Balaram Ghosh Street, Calcutta.</i>
1905 May 3.	N.R.	Ghosh, Hemendra Prasad, Zemindar and Litterateur. <i>Prasad Lodge, Changalbha P.O., Jessore.</i>
1907 Mar. 6.	R.	Ghosh, Prafulla Chundra, M.A. <i>Presidency College, Calcutta.</i>

Date of Election.		
1869 Feb. 3.	N.R.	Ghosh, Pratapa Chandra, B.A. <i>Vindiyachal.</i>
1912 Sept. 4.	R.	Ghosh, Tarapada. 14, <i>Paddapuker Street, Kidderpur, Calcutta.</i>
1902 June 4.	N.R.	Ghuznavi, The Hon. A. K. <i>Mymensingh.</i>
1913 Dec. 3.	A.	Godson, Capt. Charles Aubery, I.M.S. <i>Europe (c/o India Office).</i>
1907 Mar. 6.	R.	Goenka, Roomall. 57, <i>Burtolla Street, Calcutta.</i>
1909 Jan. 6.	R.	Gourlay, William Robert, C.I.E., I.C.S. <i>Government House, Calcutta.</i>
1910 Sept. 7.	R.	Gravely, Frederic Henry, D.Sc., Assistant Superintendent, Zoological Survey of India. <i>Calcutta.</i>
1905 May 3.	R.	Graves, Henry George, A.R.S.M. 1, <i>Council House Street, Calcutta.</i>
1910 Nov. 2.	N.R.	Graves-Law, H. D., I.C.S. <i>Simla.</i>
1907 June 5.	N.R.	Green, Lieut.-Col. Charles Robert Mortimer, M.D., F.R.C.S., I.M.S. <i>Bombay.</i>
1910 Mar. 2.	A.	*Greig, Major Edward David Wilson, M.B., I.M.S. <i>Europe (c/o India Office).</i>
1910 Sept. 7.	A.	Grey, Lt.-Col. William George, Indian Army. <i>Europe (c/o India Office).</i>
1900 Dec. 5.	L.M.	Grieve, James Wyndham Alleyne, Deputy Conservator of Forests. <i>Jalpaiguri.</i>
1915 Aug. 4.	R.	Gurner, C. W., I.C.S. <i>United Service Club, Calcutta.</i>
1901 Mar. 6.	N.R.	Habibur Rahman Khan, Maulavi, Raees. <i>Bhikanpur, District Aligarh.</i>
1892 Jan. 6.	F.M.	Haig, Lieut.-Col. Wolsley, Indian Army. H. B. M.'s Consulate Genl., <i>Meshked, Persia.</i>
1907 Aug. 7.	N.R.	*Haines, Henry Haselfoot, F.C.H., F.L.S. <i>Ranchi.</i>
1908 June 3.	R.	Hallowes, Kenneth Alexander Knight, B.A., A.R.S.M., F.G.S., Assistant Superintendent, Geological Survey of India. <i>Calcutta.</i>
1916 Jan. 5.	R.	Hamilton, C. J. University Professor. <i>Calcutta.</i>
1913 May 7.	N.R.	Hankin, E. H., M.A., D.Sc. <i>Agra.</i>
1912 May 1.	R.	Harley, A. H., M.A. <i>Madrassa, Calcutta.</i>
1906 Dec. 5.	N.R.	Harris, Lieut. G., 56th Infantry, F.F., <i>Hangu.</i>
1908 April 1.	N.R.	Harrison, Edward Philip, Ph.D., F.R.S.E. <i>(c/o Presidency College, Calcutta).</i>
1916 Feb. 2.	R.	Hashmi Mohammad Yusuf, M.A. <i>Madrassa, Calcutta.</i>
1897 Feb. 3.	R.	*Hayden, Henry Herbert, D.Sc., C.I.E., B.A., B.E., B.A.I., F.G.S., F.A.S.B., Director, Geological Survey of India. <i>Calcutta.</i>
1908 June 3.	N.R.	Heron, Alexander Macmillan, B.Sc. <i>(c/o Geological Survey of India, Calcutta).</i>

Date of Election.		
1911 April 5.	N.R.	Hiralal, Rai Bahadur, B.A., M.R.A.S. <i>Chhindwara, C.P.</i> [Army, Shillong.
1908 April 1.	N.R.	Hirst, Captain Frederick Christian. <i>Indian</i>
1891 July 1.	R.	*Holland, Sir Thomas Henry, K.C.I.E., D.Sc., A.R.C.S., F.G.S., F.R.S., F.A.S.B. <i>c/o Geological Survey of India, Calcutta.</i>
1908 July 1.	A.	Holmwood, The Hon. Mr. Justice Herbert, I.C.S. <i>Europe (c/o India Office).</i>
1910 Jan. 5.	R.	Hope, Geoffroy D., B.Sc., Ph.D. 27, <i>Chowringhee Road, Calcutta.</i>
1914 Feb. 4.	R.	Hornell, The Hon. Mr. W. W., Director of Public Instruction, Bengal. <i>Writers' Building, Calcutta.</i>
1901 Dec. 4.	R.	Hossack, William Cardiff, M.D., D.P.H. <i>United Service Club, Calcutta.</i>
1873 Jan. 2.	L.M.	Houstoun, George L., F.G.S. <i>Johnstone Castle, Renfrewshire, Scotland.</i>
1911 June 7.	R.	Husain, M. Hedayat. 7-1, <i>Ramsanker Roy's Lane, Calcutta.</i>
1908 June 3.	N.R.	Hutchinson, C. M. <i>Pusa.</i>
1911 Feb. 1.	R.	Insch, Jas. 101, <i>Olive Street, Calcutta.</i>
1915 April 7.	N.R.	Ishak Khan Maulavi Mahomed. <i>M. A. O. College, Aligarh.</i>
1904 Jan. 6.	N.R.	Jackson, Victor Herbert, M.A. <i>Patna College, Bankipur.</i>
1908 Nov. 4.	N.R.	Jacob, Sydney Montague, I.C.S. <i>(c/o Messrs. King King & Co., Bombay).</i>
1916 Jan. 5.	N.R.	Jain Kumar Devendra Prasad, Secy., All-India Jain Association. <i>Arrah.</i>
1907 Dec. 4.	A.	James, Henry Rosher, M.A., Bengal Education Service. <i>Europe (c/o India Office).</i>
1907 Sept. 25.	R.	Jenkins, Owen Francis, I.C.S. 1, <i>Council House Street, Calcutta.</i>
1912 Mar. 6.	A.	Jessop, W. <i>Europe (c/o Young Men's Christian Association, Calcutta).</i>
1908 June 3.	A.	Jones, Herbert Cecil, A.R.S.M., A.R.C.S., F.G.S. <i>Europe (c/o Geological Survey of India, Calcutta).</i>
1911 Sept. 1.	N.R.	Juggarao, Sree Raja Ankitam Venkata. <i>Zemindar of Shermahamadpuram, Dabagardens, Vizagapatam.</i>
1911 Nov. 1.	A.	Kamaluddin Ahmed, Shams-ul-Ulama. <i>Europe (c/o Govt. Madrasa, Chittagong).</i>
1915 Oct. 27.	N.R.	Kaushala, R. S. <i>Ambala City.</i>
1891 Feb. 4.	N.R.	Kapur, Raja Ban Behari, c.s.i. <i>Burdwan.</i>
1911 Jan. 1.	A.	Kaye, George Rusby, Registrar. <i>Europe (c/o India Office).</i>

Date of Election.		
1910 May. 4.	R.	*Kemp, Stanley W., B.A., F.A.S.B., Superintendent, Zoological Survey of India. <i>Calcutta.</i>
1882 Mar. 1.	N.R.	Kennedy, Pringle, M.A., B.L., Vakil. <i>Mozufferpur.</i>
1906 Aug. 1.	R.	Kennedy, William Willoughby, M.A., M.D., D.P.H., M.R.S.C., L.R.C.P. 10, <i>Harrington St., Calcutta.</i>
1906 Sept. 19.	R.	Kesteven, Charles Henry, Solicitor to Government. 26, <i>Dalhousie Square, Calcutta.</i>
1909 April 7.	R.	Kilner, John Newport, M.B., L.R.C.S., L.R.C.P. <i>Garden Reach, Calcutta.</i>
1910 Mar. 2.	R.	Kirkpatrick, W. <i>Chartered Bank Buildings, Calcutta.</i>
1914 April 1.	N.R.	Laddu, Tukaram Krishna. <i>Queen's College, Benares.</i>
1887 May 4.	L.M.	Lanman, Charles Rockwell. 9, <i>Farrar Street, Cambridge, Massachusetts, U.S. America.</i>
1889 Mar. 6.	L.M.	*La Touche, Thomas Henry Digges, B.A., F.G.S., F.A.S.B. <i>Alfriston Hills Road, Cambridge, England.</i>
1914 Aug. 5.	R.	Law, Bimala Charan, B.A. 24, <i>Sukea St., Calcutta.</i>
1911 Feb. 1.	R.	Law, Narendra Nath, M.A., B.L. 96, <i>Amherst St., Calcutta.</i>
1914 July 1.	R.	Law, Satya Charan, M.A., B.L. 24, <i>Sukea St., Calcutta.</i>
1909 Jan. 6.	A.	Leake, A. Martin, F.R.C.S., V.C. <i>Europe (c/o Bengal Nagpur Railway).</i>
1902 July 2.	N.R.	Leake, Henry Martin, M.A., F.L.S. <i>Nawabgunj, Cawnpore.</i>
1907 Dec. 4.	N.R.	Little, James Henry, Assistant Master, Nawab Bahadur's Institution. <i>Murshidabad.</i>
1907 Mar. 6.	R.	Lloyd, Major Richard Ernest, M.B., B.Sc., I.M.S. <i>Medical College, Calcutta.</i>
1911 May 3.	R.	Lomax, C. E., M.A. 11, <i>London Street, Calcutta.</i>
1906 Oct. 31.	N.R.	Luard, Capt. Charles Eckford, Indian Army, M.A. (Oxon). <i>Nimach.</i>
1910 April 6.	A.	Ludwig, Eugen. <i>Europe.</i>
1913 Jan. 8.	A.	Luxburg, Count Graf Karl L. <i>Europe.</i>
1870 April 7.	L.M.	Lyman, B. Smith. 708, <i>Locust Street, Philadelphia, U.S. America.</i>
1912 April 3.	A.	MacCabe, Surgeon Capt. Frederick. <i>Europe (c/o India Office).</i>
1905 Aug. 2.	R.	McCay, Major David, M.D., I.M.S. <i>Medical College, Calcutta.</i>
1916 July 5.	N.R.	MacKenna, J., I.C.S., Agricultural Adviser to the Government of India. <i>Pusa.</i>

Date of Election.		
1893 Jan. 11.	L.M.	MacLagan, The Hon. Sir Edward Douglas, M.A., K.C.I.E., C.S.I., I.C.S., Secretary, Government of India, Education Department. <i>Simla.</i>
1912 May 1.	R.	McLean, David. <i>Chowringhee Mansions, Calcutta.</i>
1913 Mar. 5.	A.	MacMahon, P. S. <i>Europe (c/o Canning College, Lucknow.</i>
1893 Jan. 11.	L.M.	Madho Rao Scindia, His Highness Maharajah Colonel Sir, <i>Alijah Bahadur</i> , G.C.S.I., G.C.V.O., A.D.C., LL.D., Maharajah of Gwalior. <i>Jai Bilas, Gwalior.</i>
1916 June 7.	N.R.	Mahajan, Surya Prasad. <i>Murarpur, Gaya.</i>
1906 Dec. 5.	R.	Mahalanobis. Subodh Chandra, B.Sc., F.R.S.E., F.R.M.S. 210, <i>Cornwallis Street, Calcutta.</i>
1911 Mar. 1.	R.	Mahatap, The Hon. Sir Bijoy Chand, K.C.S.I., Maharajadhiraj of Burdwan. 6, <i>Alipur Lane, Calcutta.</i>
1898 Nov. 2.	N.R.	Maitra, Akshaya Kumar, B.A., B.L. <i>Rajshahi.</i>
1901 July 6.	A.	Malyon, Lieut. Frank Hailstone. <i>Europe (c/o India Office).</i>
1901 June 5.	N.R.	Mann, Harold Hart, D.Sc., M.Sc., F.L.S., Principal, Agricultural College. <i>Poona.</i>
1907 Dec. 4.	N.R.	Manners-Smith, Lieut.-Col. John, Indian Army, C.V.O., C.I.E., Resident, Nepal. <i>Khatmandu.</i>
1899 Aug. 30.	N.R.	Mannu Lal, Rai Bahadur, Retired Civil Surgeon. <i>Rai Bareilly.</i>
1905 Dec. 6.	F.M.	Marsden, Edmund, B.A., F.R.G.S. 12 <i>Elerdale Road, Hampstead, London.</i>
1916 Feb. 2.	R.	Majemdar, Narendra Kumar, M.A., Asst. Prof. <i>Calcutta University, Calcutta.</i>
1912 Jan. 10.	N.R.	Mazumdar, Rai Jadunath, Bahadur, Government Pleader. <i>Jessore.</i>
1913 June 4.	R.	Mazumdar, Ramesh Chandra, M.A. 16, <i>Chandranath Chatterji Street, Bhuvanipur, Calcutta.</i>
1886 Mar. 3.	L.M.	Mehta, Roostumjee Dhunjibhoy, C.I.E. 9, <i>Rainey Park, Ballygunge, Calcutta.</i>
1895 July 3.	A.	Melitus, Paul Gregory, C.I.E., I.C.S. <i>Europe (c/o India Office).</i>
1914 May 6.	N.R.	Menon, K. Ramunni. <i>Presidency College, Madras.</i>
1884 Nov. 5.	R.	*Middlemiss, Charles Stewart, B.A., F.G.S., F.A.S.B., Superintendent, Geological Survey of India. <i>Calcutta.</i>
1884 Sept 3.	R.	Miles, William Harry. 21 <i>Old Court House Street, Calcutta.</i>
1912 June 5.	N.R.	Misra, Champaram. <i>Barabanki, Oudh.</i>
1911 July 5.	N.R.	Misra, Rai Sahib Shyam Behari, B.A., I.C.S., Revenue Member, Council of Regency. <i>Jodhpur.</i>

Date of Election.		
1906 June 6.	R.	Mitra, Kumar Manmatha Nath. 34, <i>Sham-pukur Street, Calcutta.</i>
1915 Jan. 6.	R.	Mitra, Prakash Chandra, Engineer and Contractor. 16, <i>Amherst Street, Calcutta.</i>
1909 May 5.	N.R.	Mohyuddin Ahmad, Maulavi Abul-Kalam, Azad. <i>Ranchi.</i>
1901 Aug. 7.	N.R.	Molony, Edmund Alexander, I.C.S. <i>Allahabad.</i>
1895 July 3.	R.	Monahan, The Hon. Mr. Francis John, I.C.S. <i>Harrington Mansions, Calcutta.</i>
1906 Dec. 5.	A.	More, Capt. James Carmichael. 51st <i>Sikhs. Europe (c/o Army Dept., Simla).</i>
1908 Dec. 2.	A.	Moses, Capt. Owen St. John, M.D., F.R.C.S., I.M.S. <i>Europe (c/o India Office).</i>
1912 Jan. 10.	R.	Muhammad Kazim Shirazi, Aga. 23, <i>Lower Chitpur Road, Calcutta.</i>
1909 Mar. 3.	R.	Mukherjee, Brajalal, M.A. 12, <i>Old Post Office Street, Calcutta.</i>
1916 Jan. 5.	R.	Mukerjee, Harendra Kumar, Asst. Prof. <i>Calcutta University, Calcutta.</i>
1899 Sept. 29.	R.	Mukherjee, Jotindra Nath, B.A., Solicitor. 3, <i>Old Post Office Street, Calcutta.</i>
1916 Mar. 1.	R.	Mukerjee, Prabhat Kumar, Bar-at-Law. 4, <i>Chouringhee Road, Calcutta.</i>
1898 May 4.	R.	Mukherjee, Sir Rajendra Nath, K.C.I.E. 7, <i>Harrington Street, Calcutta.</i>
1894 Aug. 30.	R.	Mukherjee, Sibnarayan. <i>Uttarpara, Bally.</i>
1886 May 5.	L.M.	*Mukhopadhyaya, The Hon. Justice Sir Asutosh, Kt., C.S.I., M.A., D.L., D.Sc., F.R.S.E., F.R.A.S., F.A.S.B., Judge, High Court. <i>Calcutta.</i>
1908 Feb. 5.	R.	Mukhopadhyaya, Girindra Nath, B.A., M.D. 156, <i>Haris Mukerjee Road, Bhovanipur, Calcutta.</i>
1892 Dec. 7.	R.	Mukhopadhyaya, Panchanan. 46, <i>Bechoo Chatterji's Street, Calcutta.</i>
1910 Nov. 2.	A.	Murray, William Alfred, B.A. (Cantab), M.B. <i>Europe (c/o Assam Bengal Railway, Chittagong).</i>
1906 Mar. 7.	R.	Nahar, Puran Chand. 48, <i>Indian Mirror Street, Calcutta.</i>
1916 July 5.	R.	Naseer Hoseni Khankhayab, Syed. 78, <i>Prinsep St., Calcutta.</i>
1904 Dec. 7.	A.	Nathan, Robert, C.S.I., I.C.S. <i>Europe (c/o India Office).</i>
1914 Feb. 4.	R.	Nawab Ali, Chaudhury, The Hon. Nawab Syed. 27, <i>Weston Street, Calcutta.</i>
1914 Feb. 4.	N.R.	Neogi, Panchanan. <i>Rajshahi College, Rajshahi.</i>
1901 Mar. 6.	N.R.	Nevill, Henry Rivers, I.C.S. <i>Etawah.</i>
1889 Aug. 29.	L.M.	Nimmo, John Duncan. <i>c/o Messrs. Walter Duncan & Co., 137, West George Street, Glasgow.</i>

Date of Election.		
1913 July 2.	N.R.	Norton, E. L., I.C.S., District Magistrate. <i>Allahabad.</i>
1908 Feb. 5.	A.	Nott, Lieut.-Col. Arthur Holbrook, M.D., I.M.S. <i>Europe (c/o India Office).</i>
1916 Feb. 2.	R.	Oka, Rev. R. (c/o Bangae & Co., 35, <i>Park Mansions, Calcutta.</i>)
1906 Dec. 5.	R.	O'Kinealy, Lieut.-Col. Frederick, M.R.C.S. (Eng.), L.R.C.P. (Lond.), I.M.S. <i>Presidency General Hospital, Calcutta.</i>
1915 April 7.	F.M.	Otani, Count Kozui. <i>c/o Consulate-General of Japan, Calcutta.</i>
1907 July 3.	A.	Page, William Walter Keigley. <i>Europe (c/o Pugh & Co., Calcutta).</i>
1901 Jan. 2.	N.R.	Pande, Ramavatar, B.A., I.C.S., District Judge. <i>Mirzapur, U.P.</i>
1901 Aug. 28.	A.	Panton, Edward Brooks Henderson, B.A., I.C.S. <i>Europe (c/o India Office).</i>
1904 Aug. 3.	N.R.	Parasnis, Rao Bahadur Dattalraya Balwant. <i>Satara.</i>
1910 April 6.	N.R.	Patuck, Pestonji Sorabji, I.C.S. <i>Narsinghpur.</i>
1899 Aug. 2.	R.	Peake, Charles William, M.A. <i>The Observatory, Alipur, Calcutta.</i>
1906 Dec. 5.	N.R.	Peart, Major Charles Lubé. <i>106th Hazara Pioneers, Quetta.</i>
1916 July 5.	N.R.	Pease, Col. H. T., C.I.E., M.R.C.V.S. <i>Veterinary College, Lahore.</i>
1888 June 6.	L.M.	Pennell, Aubray Percival, B.A., Bar.-at-Law. <i>Rangoon.</i>
1877 Aug. 1.	N.R.	Peters, Lieut.-Col. Charles Thomas, M.B., I.M.S. (retired). <i>Dinajpur.</i>
1915 Oct. 27.	R.	Phelps, William Heath. <i>Park House, 13 Park Street, Calcutta.</i>
1915 May 5.	A.	Philby, H. St. J. B., I.C.S. <i>Europe (c/o Alliance Bank, Calcutta).</i>
1889 Nov. 6.	L.M.	*Phillott, Lieut.-Colonel Douglas Craven, PH.D., F.A.S.B. <i>Indian Army (retired). c/o Messrs. Grindlay & Co., 54, Parliament Street, London.</i>
1914 Nov. 4.	A.	Pickford Alfred Donald. <i>12, Mission Row, Calcutta.</i>
1904 June 1.	N.R.	Pilgrim, Guy Ellicock, D.Sc., F.G.S. <i>(c/o Geological Survey of India, Calcutta).</i>
1910 Aug. 3.	R.	Podamraj Jain, Raniwalla. <i>9, Joggomohan Mullick's Lane, Calcutta.</i>
1906 Aug. 1.	N.R.	Price, Charles Stanley. <i>Victoria Boys' School, Kurseong.</i>
1914 Mar. 4.	N.R.	Raffin, Alain. <i>Mirzapur.</i>
1880 April 7.	N.R.	Rai, Bepin Chandra. <i>Giridih, Chota Nagpur.</i>

Date of Election.		
1895 Aug. 29.	N.R.	Rai Chaudhuri, Jatindranath, M.A., B.L., Zemindar. <i>Taki, Jessore.</i>
1908 Feb. 5.	N.R.	Randle, Herbert Neil, B.A. <i>Queen's College,</i> <i>Benares.</i>
1908 July 1.	N.R.	Ranganathasvami, S. P. V., <i>Aryavaraguru,</i> <i>Arshya Library, Vizagapatam.</i>
1905 Jan. 4.	N.R.	Rankin, James Thomas, I.C.S. <i>Darjeeling.</i>
1904 Mar. 4.	F.M.	Rapson, E. J. S, <i>Mortimer Road, Cambridge.</i>
1890 Mar. 5.	R.	* Ray, Prafulla Chandra, D.Sc., F.A.S.B., Pro- fessor, Presidency College. <i>Calcutta.</i>
1905 May 3.	R.	Richardson, The Hon. Mr. Justice Thomas William, I.C.S. 21, <i>Belvedere Road, Cal-</i> <i>cutta.</i>
1913 Sept. 3.	A.	Rogalsky, P. A. <i>Europe (c/o Imperial Russian</i> <i>Consulate General, Calcutta).</i>
1903 Mar. 4.	N.R.	Rogers, Charles Gilbert, F.L.S., F.C.H., Forest Department (<i>c/o Grindlay & Co., Calcutta).</i>
1900 April 4.	R.	* Rogers, Lt.-Col. Sir Leonard, Kt., C.I.E., M.D., B.S., F.R.C.P., F.R.C.S., F.A.S.B., F.R.S., I.M.S. <i>Medical College, Calcutta.</i>
1901 Dec. 4.	F.M.	* Ross, Edward Denison, C.I.E., Ph.D., F.A.S.B., British Museum, Dept. of Oriental Books and MSS. <i>London.</i>
1909 Nov. 3.	N.R.	Roychaudhury, Mrityunjoy. <i>Shyampur P.O.,</i> <i>Rungpur.</i>
1889 June 5.	N.R.	Roy, Maharaja Girjanath. <i>Dinapore.</i>
1903 July 1.	L.M.	Roy, Maharaja Jagadindranath, Bahadur. 6, <i>Lansdowne Road, Calcutta.</i>
1915 Oct. 27.	R.	Roy, Kaviraj Jamini Bhusan, M.A., M.B. <i>Bea-</i> <i>don St., Calcutta.</i>
1910 Sept. 7.	N.R.	Roy, Kumar Sarat Kumar. <i>Dayarampur,</i> <i>Rajshahi.</i>
1914 June 3.	R.	Roy, Dr. Satyendra Nath. 49, <i>Chakraberi</i> <i>Road, North, Bhawanipur, Calcutta.</i>
1915 April 7.	R.	Roy, Hon Mr. Surendra Nath, Vakil, High Court. <i>Calcutta.</i>
1906 Feb. 7.	N.R.	Russell, Charles, M.A. <i>Patna College, Bankipur.</i>
1916 April 5.	N.R.	Saha, Radha Nath. 16, <i>Lachmikundu, Benares</i> <i>City.</i>
1913 Apl. 2	N.R.	Sahay, Rai Sahib Bhagvati, M.A., B.L., Offg. Inspector of Schools, Patna Division. <i>Bankipur.</i>
1911 Nov. 1	N.R.	Sahni, Dayaram, M.A., Supdt. of Archæology. <i>Jammu, Kashmir.</i>
1910 May 4.	A.	Sandes, Capt. J. D., M.B., I.M.S. <i>Europe (c/o</i> <i>India Office).</i>
191 July 5.	R.	Sarkar, Ganpati. 69, <i>Beliaghata Main Road,</i> <i>Calcutta.</i>
1898 Mar. 2.	N.R.	Sarkar, Jadunath. <i>Patna College, Bankipur.</i>

Date of Election.		
1909 Mar. 3.	R.	Sarvadhikari, The Hon. Mr. Deva Prasad, M.A., B.L. 2, <i>Old Post Office Street, Calcutta.</i>
1911 Jan. 4.	R.	Sarvadhikari, Dr. Suresh Prasad. 79-1, <i>Amherst St., Calcutta.</i>
1902 Feb. 5.	A.	Schulten, Joseph Henry Charles, Ph.D. <i>Europe.</i>
1900 Dec. 5.	A.	Schwaiger, Imre George, Expert in Indian Art. <i>Europe.</i>
1915 Feb. 3.	R.	Segard, Dr. C. P. 23, <i>Park Mansions, Calcutta.</i>
1902 May 7.	R.	Sen, Jogendra Nath, <i>Vidyaratna</i> , M.A. 31, <i>Prasanna Kumar Tagore's Street, Calcutta.</i>
1914 April 1.	N.R.	Sen-Gupta, Dr. Nares Chandra. <i>Dacca.</i>
1897 Dec. 1.	R.	Seth, Mesrobian J. 19, <i>Lindsay Street, Calcutta.</i>
1911 July 5.	F.M.	Sewell, Capt. Robert Beresford Seymour, M.R.C.S., L.R.C.P., I.M.S. (<i>c/o Indian Museum, Calcutta</i>).
1885 Feb. 4.	L.M.	*Shastri, Mahamahopadhyaya Haraprasad, C.I.E., M.A., F.A.S.B. 26, <i>Pataldanga Street, Calcutta.</i> [Delhi.]
1902 Dec. 3.	N.R.	Shastri, Harnarain Goswami. <i>Hindu College,</i>
1909 Jan. 6.	N.R.	Shirreff, Alexander Grierson, B.A., I.C.S. Inspector of Schools. <i>Bareilly.</i>
1913 Dec. 3.	A.	Shorten, Capt. James Alfred, B.A., M.B., B.Ch., I.M.S. <i>Europe (c/o India Office).</i>
1914 Mar. 4.	A.	Shroobree, A. de Bois. <i>Europe (c/o Improvement Trust, Calcutta).</i>
1908 Mar. 4.	R.	Shujaat Ali, Nasurul Mamalik Mirza, Khan Bahadur, Acting Consul-General for Persia. 10, <i>Hungerford Street, Calcutta.</i>
1916 Aug. 2.	N.R.	Shukla, Pandit Ashwani Kumar, B.A., LL.B., Revenue Officer, Mewar State. <i>Udaipur.</i>
1902 Feb. 5.	N.R.	Shyam Lal, Lala, M.A., LL.B., Deputy Collector. <i>Naimadri, Agra.</i>
1899 May 3.	N.R.	Silberrad, Charles Arthur, B.A., B.Sc., I.C.S., <i>Gorakhpur, U.P.</i>
1913 Mar. 5.	N.R.	Simonsen, J. L., D.Sc. <i>Presidency College, Madras.</i>
1909 April 7.	N.R.	Simpson, George Clarke, D.Sc. <i>Simla.</i>
1894 July 4.	N.R.	Singh, Raja Kushal Pal, M.A. <i>Narkhi.</i>
1895 Aug. 29.	N.R.	Singh, Lachmi Narayan, M.A., B.L., Pleader, High Court. <i>Bankipur.</i>
1912 May 1.	R.	Singh Ray, Lalit Mohan, Rai Bahadur. 4, <i>Creek Row, Calcutta.</i>
1893 Mar. 1.	N.R.	Singh, Maharaja Kumara Sirdar Bharat, I.C.S. (retired). <i>Shankergar, Allahabad.</i>
1892 Mar. 2.	L.M.	Singh, Raja Ooday Pratab, C.S.I., Raja of Bhinga. <i>Bhinga.</i>
1899 Aug. 29.	N.R.	Singh, H.H. The Maharaja Sir Prabhu Narain, Bahadur, G.C.I.E., Maharaja of Benares. <i>Ramnagar Fort, Benares.</i>

Date of Election.		
1909 April 7.	N.R.	Singh, Raja Prithwipal, Talukdar of Surajpur. <i>District Barabanki, Oudh.</i>
1889 Nov. 6.	L.M.	Singh, H.H. The Hon. Maharaja Sir Rameshwara, <i>Bahadur, K.C.I.E. Durbhanga.</i>
1912 Mar. 6.	R.	Singh, Maharaja Ranjit. <i>Nasipur.</i>
1913 July 2.	N.R.	Singh, Rudradat, M.A., LL.B., Vakil. <i>Lucknow.</i>
1894 Feb. 7.	N.R.	Singh, H.H. The Maharaja Vishwa Nath, <i>Bahadur. Chhatturpur, Bundelkhund.</i>
1912 Sept. 5.	N.R.	Singhi, Bahadur Sing. <i>Azimgunj, Murshidabad.</i>
1897 Jan. 6.	R.	Sircar, Amrita Lal, F.C.S., L.M.S. 51, <i>Sunkaritolta Lane, Calcutta.</i> [habad.
1898 Aug. 3.	N.R.	Sita Ram, Lala, B.A., Depy. Magistrate. <i>Alla-</i>
1913 July 2.	N.R.	Sivaprasad, B.A., Offg. Junior Secretary to the Board of Revenue, U.P. <i>Allahabad.</i>
1911 Mar. 1.	N.R.	Smith, Major O. A. 27th <i>Punjabis, Huzaribagh.</i>
1912 Jan. 10.	R.	Southwell, T., A.R.C.S., F.Z.S., F.L.S., Deputy Director of Fisheries. <i>Writers' Buildings, Calcutta.</i>
1901 Dec. 4.	N.R.	*Spoonner, David Brainerd. <i>Bankipur.</i>
1913 July 2.	N.R.	Srinivas Iyenger, P. T., Principal, M.A.V.N. College. <i>Vizagapatam.</i>
1912 May 1.	A.	Stadler, George L. <i>Europe (48, Grand Marché, Maestricht, Holland).</i>
1912 Oct. 30.	N.R.	Stallard, Dr. Philip Lechmen, District Surgeon, G.I.P. Railway. <i>Igatpuri, Bombay.</i>
1904 Sept. 28.	A.	Stapleton, Henry Ernest, B.A., B.Sc. <i>Europe (c/o India Office).</i>
1908 Dec. 2.	A.	Steen, Capt. Hugh Barkley, M.B., I.M.S. <i>Europe (c/o India Office).</i>
1904 June 1.	A.	Stephen, The Hon. Mr. Justice Harry Lushington. <i>Europe (c/o India Office).</i>
1900 Aug. 29.	N.R.	Stephenson, Lieut.-Col. John, I.M.S. <i>Lahore.</i>
1907 Dec. 4.	A.	Stevens, Lieut.-Col. C. R., I.M.S. <i>Europe (c/o India Office).</i>
1907 June 5.	A.	Stewart, Capt. Francis Hugh, I.M.S. <i>Europe (c/o India Office).</i>
1906 Dec. 5.	A.	Stokes, Captain Claude Bayfield. <i>Europe (c/o India Office).</i> [Burn & Co.).
1911 Feb. 1.	A.	Stonebridge, Arthur W. <i>Europe (c/o Messrs.</i>
1915 April. 7.	N.R.	Storey, O. A., Prof. of Arabic, M. A. O. College. <i>Aligarh.</i>
1914 Jan. 7.	N.R.	Strauss, Dr. O. <i>Ahmednagar.</i>
1916 July 5.	R.	Street, W. S. <i>Shaw Wallace & Co., Calcutta.</i>
1907 Aug. 7.	N.R.	Subramania Iyer, Valavanur, Extra Asst. Conservator of Forests. <i>Coimbatore.</i>
1907 June 5.	R.	Suhrawardy, Abdullah Al-Ma'mun, Iftikharul Millat, M.A., D.Litt., LL.D., Bar.-at-Law. 3, <i>Wellesley 1st Lane, Calcutta.</i>

Date of Election.		
1914 Mar. 4.	R.	Sutherland, Lt.-Col. William Dunbar, I.M.S. <i>U.S. Club, Calcutta.</i>
1916 Sept. 27.	N.R.	Sutherland, Rev. W. S., D.D., Scottish Universities Mission. <i>Kalimpong, Darjeeling Dist.</i>
1907 June 5.	A.	Swinhoe, Rodway Charles John. <i>Europe (c/o High Court, Rangoon).</i>
1909 Jan. 6.	R.	Tagore, Kshitindranath, B.A. 6/1, <i>Dwarkanath Tagore Lane, Calcutta.</i>
1914 April 1.	R.	Tagore, Prafulla Nath. 1, <i>Darpanurain Tagore Street, Calcutta.</i>
1898 April 6.	R.	Tagore, The Hon. Maharaja Sir Prodyat Coomar, Bahadur, kt. <i>Pathuriaghatta, Calcutta.</i>
1904 July 6.	N.R.	Talbot, Walter Stanley, I.C.S. <i>Revenue Commissioner, Kashmir.</i>
1910 Aug. 3.	N.R.	Tancock, Capt. Alexander Charles. 31st <i>Punjabis, Nowshera, N.W.F.P.</i>
1893 Aug. 31.	A.	Tate, George Passman. <i>Europe (c/o Survey of India).</i>
1906 Dec. 5.	N.R.	Tek Chand, Dewan, B.A., M.R.A.S., I.C.S., Deputy Commissioner. <i>Gujranwala, Punjab.</i>
1878 June 5.	F.M.	Temple, Colonel Sir Richard Carnac, Bart., Indian Army, C.I.E. 9, <i>Pall Mall, London.</i>
1914 Aug. 5.	N.R.	Tessitori, Dr. L. P. <i>Bikaner, Rajputana.</i>
1904 May 4.	N.R.	Thanawala, Framjee Jamasjee. 85, <i>Bazar Gate St., Fort, Bombay.</i>
1911 Mar. 1.	F.M.	Thomas, F. W., M.A., Ph.D., Librarian, India Office. <i>London.</i>
1909 Aug. 4.	N.R.	Thompson, John Perronet, M.A., I.C.S. <i>Lahore.</i>
1908 Nov. 4.	A.	Thornely, Major, Michael Harris, I.M.S. <i>Europe (c/o India Office).</i>
1911 July 5.	A.	Thurston, Capt. Edward Owen, I.M.S., B.S., F.R.C.S. <i>Europe (c/o India Office).</i>
1904 June 1.	A.	*Tipper, George Howlett, M.A., F.G.S. <i>Europe (c/o Geological Survey of India, Calcutta).</i>
1912 Nov. 6.	R.	Tomkins, H. G., C.I.E., F.R.A.S. <i>Accountant General Bengal, Calcutta.</i>
1907 Feb. 6.	F.M.	*Travers, Morris William, D.Sc., F.R.S., F.A.S.B. 43, <i>Warwick Gardens, London, W.</i>
1861 June 5.	L.M.	Tremlett, James Dyer, M.A., I.C.S. (retired). <i>Dedham, Essex, England.</i>
1894 Sep. 27.	R.	Vasu, Nagendra Nath. 20, <i>Visvakos Lane, Baghazaar, Calcutta.</i>
1900 Aug. 29.	A.	Vaughan, Lieut.-Col. Joseph Charles Staelke, I.M.S. <i>Europe (c/o India Office).</i>
1890 Feb. 5.	N.R.	*Venis, Arthur, M.A., D.Litt., C.I.E., F.A.S.B. <i>Benares.</i>

Date of Election.		
1902 June 4.	R.	*Vidyabhusana, Mahamahopadhyaya Satis Chandra, M.A., Ph.D. F.A.S.B. 26/1, <i>Kunay Lal Dhur's Lane, Calcutta.</i>
1901 Mar. 6.	F.M.	*Vogel, Jean Philippe, Litt.D., F.A.S.B. <i>The University, Leiden, Holland.</i>
1894 Sept. 27.	L.M.	Vost, Lieut.-Col. William, I.M.S., Civil Surgeon. <i>Secunderabad.</i>
1902 Oct. 29.	R	*Vredenburg, Ernest, B.L., B.Sc., A.R.S.M., A.R.C.S., F.G.S., F.A.S.B. 27, <i>Chowringhee Road, Calcutta.</i>
1909 Jan 6.	N.R	*Walker, Gilbert Thomas, C.S.I., D.Sc., M.A., F.R.S., F.A.S.B., Director-General of Observatories. <i>Simla.</i>
1907 July 3	R.	Walker, Harold, A.R.C.S., F.G.S., A.M. Inst. M., Assistant Superintendent, Geological Survey of India. <i>Calcutta.</i>
1901 June 5.	N.R.	Walsh, The Hon. Mr. Ernest Herbert Cooper, c.s.i., I.C.S., Commissioner, Chota Nagpur Divn. <i>Ranchi.</i>
1911 Feb. 1.	N.R.	Waters, Dr. Harry George, F.R.I.P.H. <i>Asansol.</i>
1905 Dec 6.	A.	Watson, Edwin Roy, M.A., B.Sc. <i>Europe (c/o Dacca College, Dacca).</i>
1910 Sept. 7.	A.	Watts, H. P., B.A. (Cantab). <i>Europe (c/o La Martinere College, Calcutta).</i>
1909 Dec. 1.	N.R.	Webster, J. E., I.C.S. <i>Sylhet, Assam.</i>
1913 April 2.	R.	White, Bernard Alfred. <i>Chartered Bank Buildings, Calcutta.</i>
1915 Jan'y. 6.	N.R.	Whitehouse, Richard H., Prof. of Biology, <i>Agra College, Agra.</i>
1906 Sept. 19.	N.R.	Whitehead, Richard Bertram, I.C.S. <i>Rupar, Umbala, Punjab.</i>
1915 May 5.	N.R.	Williams, L. F. Rushbrook, B.A., B.Litt., Prof. of Modern Indian History, Allahabad University. <i>Allahabad.</i>
1909 April 7.	N.R.	Woodhouse, E. J., B.A. <i>Sabour.</i>
1912 Mar. 6.	R.	Woodroffe, The Hon. Justice Sir John George, kt. 4, <i>Camac Street, Calcutta.</i>
1906 Mar. 7.	N.R.	Woolner, Alfred Cooper, M.A., Principal, Oriental College. <i>Lahore.</i>
1908 April 1.	R.	Wordsworth, William Christopher, <i>Presidency College, Calcutta.</i>
1894 Aug. 30.	A.	Wright, Henry Nelson, B.A., I.C.S. <i>Europe (c/o India Office).</i>
1911 Aug. 2.	N.R.	Young, Gerald Mackworth, B.A., I.C.S. <i>Simla.</i>
1906 June 6.	N.R.	Young, Mansel Charles Gambier. <i>Asansol.</i>
1910 April 6.	N.R.	Young, Capt. Thomas Charles McCombie, M.B., I.M.S. <i>Shillong, Assam.</i>

SPECIAL HONORARY CENTENARY MEMBERS.

Date of Election.	
1884 Jan. 15.	Dr. Ernst Haeckel, Professor in the University of Jena. <i>Prussia.</i>
1884 Jan. 15.	Rev'd. Professor A. H. Sayce, Professor of Assyriology, Queen's College. <i>Oxford, England.</i>
1884 Jan. 15.	Monsieur Émile Senart. 18, Rue François Ier, <i>Paris, France.</i>

HONORARY FELLOWS.

Date of Election.	
1879 June 4.	Dr. Jules Janssen. <i>Observatoire d'Astronomie Physique de Paris, France.</i>
1894 Mar. 7.	Professor Theodor Noeldeke. <i>C/o Mr. Karl T. Trübner, Strassburg, Germany.</i>
1895 June 5.	Lord Rayleigh, M.A., D.C.L., D.Sc., LL.D., Ph.D., F.R.A.S., F.R.S. <i>Ferling Place, Witham, Essex, England.</i>
1895 June 5.	Charles H. Tawney, Esq., M.A., C.I.E. <i>C/o India Office, London.</i>
1896 Feb. 5.	Professor Charles Rockwell Lanman. 9, <i>Farrar Street, Cambridge, Massachusetts, U.S. America.</i>
1899 Feb. 1.	Dr. Augustus Frederick Rudolf Hearnle, Ph.D., C.I.E. 8, <i>Northmoor Road, Oxford, England.</i>
1899 Dec. 6.	Professor Edwin Ray Lankester, M.A., LL.D., F.R.S., <i>British Museum (Nat. Hist.), Cromwell Road, London, S.W.</i>
1899 Dec. 6.	Professor Edward Burnett Tylor, D.C.L., LL.D., F.R.S., Keeper, University Museum. <i>Oxford, England.</i>
1901 Mar. 6.	Professor John Wesley Judd, C.B., LL.D., F.R.S., F.G.S., Late Prof. of the Royal College of Science. 30, <i>Cumberland Road, Kew, England.</i>
1904 Mar. 2.	Professor Hendrick Kern. <i>Utrecht, Holland.</i>
1904 Mar. 2.	Professor Sir Ramkrishna Gopal Bhandarkar, K.C.I.E. <i>Poona.</i>
1904 Mar. 2.	Professor Ignaz Goldziher, Ph.D., D.Litt., LL.D. <i>Budapest, Hungary.</i>
1904 Mar. 2.	Sir Charles Lyall, M.A., K.C.S.I., C.I.E., LL.D. 82, <i>Cornwall Gardens, London, S.W.</i>
1904 Mar. 2.	Sir George Abraham Grierson, K.C.I.E., Ph.D., D.Litt., C.I.E., I.C.S. (retired). <i>Rothfarnham Camberley, Surrey, England.</i>
1906 Mar. 7.	The Right Hon'ble Baron Curzon of Kedleston, M.A., D.C.L., F.R.S. 1, <i>Carlton House Terrace, London, S.W.</i>
1908 July 1.	Lieut.-Col. Henry Haversham Godwin-Austen, F.R.S., F.Z.S., F.R.G.S. <i>Nora Godalming, Surrey, England.</i>
1908 July 1.	Dr. H. Oldenberg. <i>The University, Göttingen, Germany.</i>

Date of Election.	
1911 Sept. 6.	Lieut.-Col. Alfred William Alcock, C.I.E., M.B., LL.D., C.M.Z.S., F.R.S., I.M.S. (retd.), <i>Heathlands, Erith Road, Belvedere, Kent, England.</i>
1911 Sept. 6.	Prof. Edward George Browne, M.A., M.B., M.R.C.S., L.R.C.P., M.R.A.S. <i>Pembroke College, Cambridge.</i>
1911 Sept. 6.	Dr. A. Engler, Prof. of Systematic Botany, University of Berlin, <i>Prussia.</i>
1911 Sept. 6.	Mahamahopadhyaya Kamakhyanath Tarkavagisa. 111-4, <i>Shambazar Street, Calcutta.</i>
1915 Aug. 4.	Prof. Paul Vinogradoff, F.B.A., D.C.L. 19, <i>Linton Road, Oxford, England.</i>
1915 Aug. 4.	Monsieur Jean Geston Darboux. 3, <i>Rue Nazarine, Paris, France.</i>
1915 Aug. 4.	Sir Patrick Manson, G.C.M.G., M.D., LL.D., F.R.C.P. 21, <i>Queen Anne Street, Cavendish Square, London, W.</i>
1915 Aug. 4.	Sir Joseph John Thomson, Kt. O.M., M.A., Sc.D., D.Sc., LL.D., Ph.D. <i>Trinity College, Cambridge, England.</i>

FELLOWS.

Date of Election.	
1910 Feb. 2	N. Annandale, Esq., D.Sc., C.M.Z.S., F.L.S.
1910 Feb. 2.	The Hon'ble Justice Sir Asutosh Mukhopadhyaya, Kt., C.S.I., M.A., D.L., D.Sc., F.R.A.S., F.R.S.E.
1910 Feb. 2.	I. H. Burkill, Esq., M.A., F.L.S.
1910 Feb. 2	Mahamahopadhyaya Haraprasad Shastri, C.I.E., M.A.
1910 Feb. 2	Sir Thomas Holland, K.C.I.E., D.Sc., A.R.C.S., F.G.S., F.R.S.
1910 Feb. 2.	T. H. D. LaTouche, Esq., B.A., F.G.S.
1910 Feb. 2.	Rai Bahadur Monmohan Chakravarti, M.A., B.L.
1910 Feb. 2.	Lieut.-Colonel D. C. Phillott, Ph.D., Indian Army.
1910 Feb. 2.	Dr. Prafulla Chandra Ray, D.Sc.
1910 Feb. 2.	Lieut.-Col. Sir Leonard Rogers, Kt., C.I.E., M.D., B.S., F.R.C.P., F.R.C.S., F.R.S., I.M.S.
1910 Feb. 2.	E. D. Ross, Esq., C.I.E., Ph.D.
1910 Feb. 2.	Mahamahopadhyaya Satis Chandra Vidyabhusana, M.A., Ph.D., M.R.A.S.
1910 Feb. 2.	M. W. Travers, Esq., D.Sc., F.R.S.
1910 Feb. 2.	A. Venis, Esq., M.A., D.Litt., C.I.E.
1910 Feb. 2.	G. T. Walker, Esq., C.S.I., D.Sc., M.A., F.R.S.
1911 Feb. 1.	The Hon. Sir E. A. Gait, K.C.S.I., C.S.I., C.I.E., I.C.S.
1911 Feb. 1.	H. H. Hayden, Esq., C.I.E., D.Sc., B.A., B.E., B.A.I., F.G.S., F.R.S.
1912 Feb. 7.	H. Beveridge, Esq., I.C.S. (retired).
1912 Feb. 7.	J. C. Bose, Esq., C.S.I., C.I.E., M.A., D.Sc.
1912 Feb. 7.	P. J. Bruhl, Esq., Ph.D., F.C.S.
1912 Feb. 7.	Capt. S. R. Christophers, I.M.S.
1912 Feb. 7.	Charles Stewart Middlemiss, Esq., B.A., F.G.S.

ASSOCIATE MEMBERS.

Date of Election.	
1913 Feb. 5.	Major A. T. Gage, I.M.S.
1913 Feb. 5.	E. Vredenburg, Esq., B.I., B.Sc., A.R.S.M., A.R.C.S., F.G.S.
1913 Feb. 5.	J. Ph. Vogel, Esq., Ph.D., Litt.D.
1913 Feb. 5.	S. W. Kemp, Esq., B.A.
1915 Feb. 3.	Major E. D. W. Greig, C.I.E., M.B., I.M.S.
1915 Feb. 3.	G. H. Tipper, Esq., M.A., F.G.S.
1915 Feb. 3.	D. B. Spooner, Esq., Ph.D.
1915 Feb. 3.	H. H. Haines, Esq., F.C.H., F.L.S.
1916 Feb. 2.	Lieut.-Col. C. Donovan, M.D., I.M.S.
1916 Feb. 2.	The Hon. Mr. R. Burn, C.I.E., I.C.S.
1916 Feb. 2.	L. L. Fermor, Esq., A.R.S.M., D.Sc., F.G.S.
1875 Dec. 1.	Revd. J. D. Bate. 15, <i>St. John's Church Road, Folkestone, Kent, England.</i>
1882 June 7.	Herbert A. Giles, Esq., LL.D., Professor of Chinese in the University of Cambridge. <i>Cambridge, England.</i>
1885 Dec. 2.	Dr. A. Führer, Prof. of Sanskrit, 5, <i>Dorenbachstrasse Binningen, Basel, Switzerland.</i>
1886 Dec. 1.	Sarat Chandra Das, Rai Bahadur, C.I.E. 32, <i>Creek Row, Calcutta.</i>
1899 Nov. 1.	Revd. E. Francotte, S.J. 30, <i>Park Street, Calcutta.</i>
1902 June 4.	Revd. A. H. Francke. <i>Niesky Ober-Lausitz, Germany.</i>
1908 July 1.	Rai Sahib Dinesh Chandra Sen, B.A. 19, <i>Visvakos Lane, Calcutta.</i>
1909 Mar. 3.	Rai Balkrishna Atmaram Gupte, Bahadur. <i>Belvedere, Calcutta.</i>
1910 Sept. 7.	Shamsul Ulama Maulvi Ahmad Abdul Aziz. <i>Azeez Bag, City-Hyderabad, Deccan.</i>
1910 Sept. 7.	L. K. Anantha Krishna Iyer, Esq. <i>Trichur.</i>
1910 Dec. 7.	Rev. H. Hosten, S.J. 30, <i>Park Street, Calcutta.</i>
1913 Feb. 5.	Ekendranath Ghosh, Esq., L.M.S. <i>Medical College, Calcutta.</i>
1914 Apl. 1.	Bada Kaji Marichiman Singha. <i>Bir Library, Nepal.</i>
1915 Mar. 3.	E. Brunetti, Esq. 27, <i>Chowringhee Road, Calcutta.</i>
1915 Dec. 1.	Pandit Jainacharya Vijayadharma Surisvaraji, <i>Yasovijaya Granthamal Office, Benares City.</i>

LIST OF MEMBERS WHO HAVE BEEN ABSENT FROM INDIA THREE YEARS AND UPWARDS.*

* *Rule 40.*—After the lapse of three years from the date of a member leaving India, if no intimation of his wishes shall in the interval have been received by the Society, his name shall be removed from the List of Members.

The following members will be removed from the next Member List of the Society under the operation of the above Rule:—

H. O. Bolton, Esq.
Lieut.-Col. William George Grey, I.A.
W. Jessop, Esq.
A. Martin Leake, Esq., F.R.C.S.
Eugen Ludwig, Esq.
Surgeon Captain Frederick MacCabe.
Lieut. Frank Hailstone Malyon.
Paul Gregory Melitus, Esq., C.I.E., I.C.S.
Robert Nathan, Esq., I.C.S.
Captain J. D. Sandes, I.M.S.
Joseph Henry Charles Schulten, Esq., Ph.D.
George L. Stadler, Esq.

LOSS OF MEMBERS DURING 1916.

BY RETIREMENT.

B. K. Basu, Esq., I.C.S.
Babu Ramakanta Bhattacharjee.
Lieut.-Col. Walter James Buchanan, I.M.S.
Dr. Manmatha Nath Chatterjee.
Captain John Inglis Eadie, I.A.
Rai Bahadur Motilal Ganguly.
Dr. David Hooper.
Sir Charles Pardy Lukis, K.C.S.I.
Lewis Sydney Steward O'Malley, Esq., I.C.S.
Leonidar Petrocochino, Esq.
Dr. Prasanna Kumar Ray.
Babu Brajendra Nath Seal.

BY DEATH.

Ordinary Members.

Nawabzada A. K. M. Abdus Sabhan Khan Bahadur.
Dr. Satis Chandra Banerjee.
Rai Bahadur Bhawani Das Batra.
R. C. Burton, Esq.
Raja Saccidananda Tribhuban Dev.
Capt. Sidney Morton, I.A.
M. S. Ramaswami, Esq.

Robert J. Russell, Esq., I.C.S.
 Maulavi Saifulla Saifuddin Ahmed.
 Edward Thornton, Esq., F.R.I.B.A.
 Major Horace Hayman Wilson, I.A.

UNDER RULE 38.

Maulavi Abdur Rahim.
 Maulavi Abdus Salam.
 Maulavi Abul Aas.
 Maulavi Ahmed Hosein Khan.
 S. A. Ashgar, Esq.
 R. S. Bhatnagar, Esq.
 P. S. Ramulee Chitty, Esq.
 Syed Fida Ali.
 Suresh Chandra Ghatak, Esq.
 Babu Jogindra Chandra Ghosh.
 Babu Brijmohan Goenka.
 Babu Hem Chandra Gosswami.
 Babu Abhaya Sankar Guha.
 Babu Bipin Behari Gupta.
 Maulavi Habibur Rahman Khan.
 Reginald John Hirst, Esq.
 William A. Lee, Esq.
 Rai Sahib Srikrishna Mahapatra.
 Babu Manmatha Nath Maitra.
 Babu Manahar Lal.
 Maulavi Midhut Hosein Khan.
 Pandit Tulsi Ram Misra.
 Babu Gobin Lal Mukerjee.
 Nawab Murtaza Hosein Khan.
 Syed Muzaffar Ali Khan.
 Babu Jyoti Prakash Nandi.
 Captain Vincent Blunhardt Nesfield, I.M.S.
 Babu Sri Ram Poplai.
 Babu Surendra Chandra Roychaudhuri.
 Babu Surendra Prasad Sanyal.
 Babu Chandra Kumar Sarkar.
 Babu Girindra Kumar Sen.
 Babu Sukumar Sen.
 Kumar Shyama Kumar Tagore.

UNDER RULE 40.

George William Kuchler, Esq., C.I.E., M.A.
 A. White Robertson, Esq., F.R.C.P.
 Major Edmund Wilkinson, I.M.S.

ELLIOTT GOLD MEDAL AND CASH.

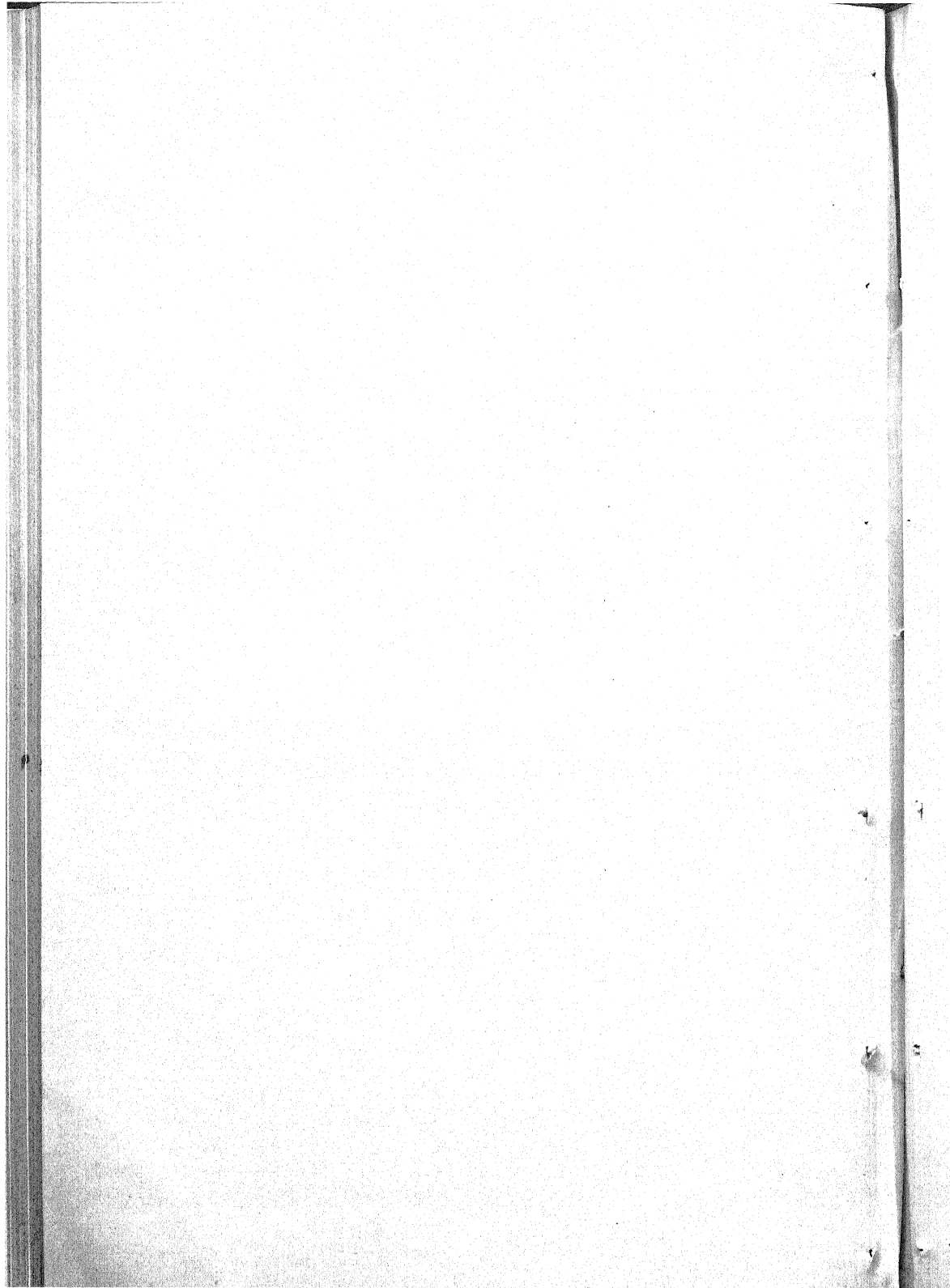
RECIPIENTS.

- 1893 Chandra Kanta Basu.
- 1895 Yati Bhusana Bhaduri, M.A.
- 1896 Jnan Saran Chakravarti, M.A.
- 1897 Sarasi Lal Sarkar, M.A.
- 1901 Sarasi Lal Sarkar, M.A.
- 1904 { Sarasi Lal Sarkar, M.A.
- { Surendra Nath Maitra, M.A.
- 1907 Akshoyakumar Mazumder.
- 1911 { Jitendra Nath Rakshit.
- { Jatindra Mohan Datta.
- { Rasik Lal Datta.
- 1913 { Saradakanta Ganguly.
- { Nagendra Chandra Nag.
- { Nilratan Dhar.

BARCLAY MEMORIAL MEDAL.

RECIPIENTS.

- 1901 E. Ernest Green, Esq.
 - 1903 Major Ronald Ross, F.R.C.S., C.B., C.I.E., F.R.S., I.M.S.
(retired).
 - 1905 Lieut.-Colonel D. D. Cunningham, F.R.S., C.I.E.,
I.M.S. (retired).
 - 1907 Lieut.-Colonel Alfred William Alcock, M.B., LL.D.,
C.I.E., F.R.S.
 - 1909 Lieut.-Colonel David Prain, M.A., M.B., LL.D.,
F.R.S., I.M.S. (retired).
 - 1911 Dr. Karl Diener.
 - 1913 Major William Glen Liston, M.D., C.I.E., I.M.S.
 - 1915 J. S. Gamble, Esq., C.I.E., M.A., F.R.S.
-



[APPENDIX.]

ABSTRACT STATEMENT
OF
RECEIPTS AND DISBURSEMENTS
OF THE
ASIATIC SOCIETY OF BENGAL
FOR
THE YEAR 1916.

1916.

STATEMENT

Asiatic Society

Dr.

To ESTABLISHMENT.

				Rs.	As.	P.	Rs.	As.	P.
Salaries ...	...	...	...	6,754	2	4			
Commission ...	...	...	...	625	6	11			
Pension ...	...	...	...	180	0	0			
Grain Allowance ...	...	...	...	106	2	3			
Gratuity ...	...	...	...	20	0	0			
							7,685	11	6

To CONTINGENCIES.

Stationery...	...	...	...	145	10	0			
Light and Fans	...	...	...	287	15	0			
Postage ...	...	...	...	742	10	0			
Freight ...	...	...	...	51	6	0			
Auditing ...	...	...	...	150	0	0			
Taxes ...	...	...	...	1,495	0	0			
Insurance	...	...	...	343	12	0			
Petty Repairs	...	...	...	17	6	0			
Miscellaneous	...	...	...	500	6	9			
							3,734	1	9

To LIBRARY AND COLLECTIONS.

Books ...	...	...	...	2,944	3	4			
Binding ...	...	...	...	351	0	0			
							3,295	3	4

To PUBLICATION.

Journal and Proceedings and Memoirs	...	...	...	8,378	9	7			
To printing charges of Circulars, etc.	...	...	...	605	15	0			
							8,984	8	7
„ Bardic Chronicles	...	...	...				1,693	14	0
„ Personal Account (written-off and miscellaneous)	...	...	...				1,385	14	0

To EXTRAORDINARY EXPENDITURE.

Royal Society's Scientific Catalogue	...	...	...				4,116	9	6
Balance	...	...	...				1,87,803	15	6
TOTAL Rs.	...	...	...				2,18,699	14	2

No. 1.
of Bengal.

1916.

Cr.

			Rs. As. P.	Rs. As. P.
By Balance from last Report	1,93,987 4 8

BY CASH RECEIPTS.

Interest on Investments	...	...	7,659 0 0	
Rent of Room	...	...	950 0 0	
Publications sold for cash	...	...	148 5 0	
Miscellaneous	...	...	173 14 0	
				8,931 3 0

BY EXTRAORDINARY RECEIPT.

Subscription to Royal Society's Scientific Catalogue	1,383 12 0
--	-----	-----	-----	------------

BY PERSONAL ACCOUNT.

Members' subscription	...	...	10,458 0 0	
Admission fees	...	...	736 0 0	
Subscription to Journal and Proceedings and Memoirs	...	...	1,800 0 0	
Sales on credit	...	...	1,219 8 0	
Miscellaneous	...	...	84 2 6	
Subscription Compounded	...	...	100 0 0	
				14,397 10 6

TOTAL Rs.	...	<u>2,18,699 14 2</u>
-----------	-----	----------------------

E. & O. E.

R. D. MEHTA,

Hon. Treasurer.

Calcutta, 31st December, 1916.

STATEMENT

1916. Oriental Publication Fund, No. 1, in*

Dr.

To CASH EXPENDITURE.

				Rs.	As.	P.	Rs.	As.	P.
Salaries	...	...	...	1,883	6	5			
Commission	...	...	...	43	11	4			
Grain allowance	...	...	...	17	2	9			
Contingencies	...	...	...	108	1	7			
Postage	...	...	...	190	15	0			
Freight	...	...	...	15	13	3			
Stationery	...	...	...	11	12	10			
Light and Fans	...	...	...	36	13	5			
Building	...	...	...	42	8	0			
Printing charges	...	...	...	2,330	6	2			
Editing charges	...	...	...	48	0	0			
							4,728	10	9
To Personal Account (write-off and miscellaneous)	...						79	2	0
Balance	...						9,615	7	1
TOTAL Rs.			...				14,423	3	10

* From monthly grants made by the Government of Bengal for the publication of Oriental Works and Works on Instruction in Eastern Languages (Rs. 500), and for the publication of Sanskrit Works hitherto unpublished (Rs. 250).

STATEMENT

1916. Oriental Publication Fund, No. 2, in*

Dr.

				Rs.	As.	P.
Balance	...	...	...	8,109	3	0
TOTAL Rs.			...	8,109	3	0

* From a monthly grant made by the Government of Bengal, and at present sanctioned till the end of the current financial year only, of Rs. 250 for the publication of Arabic and Persian Works of Historical Interest (without remuneration).

No. 2.

Acct. with the Asiatic Soc. of Bengal. 1916.

Cr.

			Rs.	As.	P.	Rs.	As.	P.
By Balance from last Report			2,300	3	4

BY CASH RECEIPTS.

Government Allowance	...	...	9,000	0	0			
Publications sold for cash	...	...	641	1	6			
Advances recovered	...	...	125	9	0			
						9,766	10	6

BY PERSONAL ACCOUNT.

Sales on credit			2,356	6	0
-----------------	-----	-----	-----	--	--	-------	---	---

TOTAL Rs.	...					14,423	3	10
-----------	-----	--	--	--	--	--------	---	----

E. & O. E.

R. D. MEHTA,

Calcutta, 31st December, 1916.

Hon. Treasurer.

No. 3.

Acct. with the Asiatic Soc. of Bengal. 1916.

Cr.

						Rs.	As.	P.
By Balance from last Report	...	...	...			5,109	3	0

BY CASH RECEIPTS.

Government Allowance	...	...	...			3,000	0	0
TOTAL Rs.	...					8,109	3	0

E. & O. E.

R. D. MEHTA,

Calcutta, 31st December, 1916.

Hon. Treasurer.

STATEMENT

1916. Oriental Publication Fund, No. 3, in*

Dr.

TO CASH EXPENDITURE.					Rs. As. P.	
Printing charges	...	...	...	...	369	1 0
Balance	...	...	...	...	1,175	7 6
TOTAL RS.					1,544	8 6

* From special non-recurring grants made by the Government of Bengal, in 1908, of Rs. 3,000 and in 1914 of Rs. 2,000, for the publication of an English translation of the Akbarnama (without remuneration).

STATEMENT

1916. Sanskrit Manuscript Fund in Acct.*

Dr.

TO CASH EXPENDITURE.					Rs. As. P.		Rs. As. P.	
Salaries	...	...	...	...	1,587	2 9		
Contingencies	...	...	...	...	19	15 0		
Grain allowance	...	...	...	...	9	15 6		
Stationery	...	...	...	...	6	2 10		
Light and Fans	...	...	...	...	34	5 4		
Insurance	...	...	...	...	125	0 0		
Purchase of MSS.	...	...	...	...	878	7 0		
Printing charges	...	...	...	...	1,209	8 0		
Bonus	...	...	...	...	420	0 0		
Binding	...	...	...	...	30	0 0		
Postage	...	...	...	...	1	7 0		
							4,321	15 5
Balance	...	...	...	...			4,649	4 2
TOTAL RS.							8,971	3 7

* From an annual grant of Rs. 3,200, made by the Government of Bengal and at present sanctioned for another year only, for the cataloguing of Sanskrit Manuscripts acquired by the Society for Government.

No. 4.

Acct. with the Asiatic Soc. of Bengal. 1916.

Cr.

	Rs.	As.	P.
By Balance from last Report	1,544	8	6

TOTAL Rs.	1,544	8	6
-----------	-------	---	---

E. & O. E.

R. D. MEHTA,

Calcutta, 31st December, 1916.

Hon. Treasurer.

No 5.

with the Asiatic Society of Bengal. 1916.

Cr.

	Rs.	As.	P.	Rs.	As.	P.
By Balance from last Report				5,708	3	7

BY CASH RECEIPTS.

Government Allowance	3,200	0	0			
Publications sold for cash	3	8	0			
				3,203	8	0

BY PERSONAL ACCOUNT.

Sales on credit				59	8	0
TOTAL Rs.				8,971	3	7

E. & O. E.

R. D. MEHTA,

Calcutta, 31st December, 1916.

Hon. Treasurer.

STATEMENT

1916. Anthropological Fund in Account*

Dr.

TO CASH EXPENDITURE.

	Rs. As. P.	Rs. As. P.
Journal and Proceedings and Memoirs ...	389 12 9	
Books	12 3 0	
	<hr/>	
		401 15 9
Balance ...	...	2,484 7 6
		<hr/>
TOTAL Rs. ...		2,886 7 3
		<hr/>

* From an annual grant of Rs. 2,000, made by the Government of Bengal, for the publication and purchase of Anthropological works.

STATEMENT

1916. Bureau of Information; and Cata*

Dr.

TO CASH EXPENDITURE.

	Rs. As. P.	Rs. As. P.
Salary (Cataloguing MSS.) ...	2,400 0 0	
Do. (Bureau of Information) ...	1,200 0 0	
	<hr/>	
		3,600 0 0
Balance ...	...	3,000 0 0
		<hr/>
TOTAL Rs. ...		6,600 0 0
		<hr/>

* From annual grants of Rs. 2,400 and Rs. 1,200 respectively, made by the Government of Bengal, for the salary of the Officer-in-Charge.

No. 6.

with the Asiatic Society of Bengal 1916

Cr.

	Rs.	As.	P.	Rs.	As.	P.
By Balance from last Report	...	...	...	886	7	3

BY CASH RECEIPT.

Government allowance	2,000	0	0
----------------------	-----	-----	-----	-------	---	---

TOTAL Rs.	...	2,886	7	3
-----------	-----	-------	---	---

E. & O. E.

Calcutta, 31st December, 1916.

R. D. MEHTA, Hon. Treasurer

No. 7.

logue, Sanskrit MSS.; in Acct., A.S.B. 1916.*

Cr.

	Rs.	As.	P.	Rs.	As.	P.
By Balance from last Report	...	...	...	3,000	0	0

BY CASH RECEIPT.

Government allowance	3,600	0	0
----------------------	-----	-----	-----	-------	---	---

TOTAL Rs.	...	6,600	0	0
-----------	-----	-------	---	---

E. & O. E.

Calcutta, 31st December, 1916.

R. D. MEHTA, Hon. Treasurer.

STATEMENT 1916. *Arabic and Persian MSS. Fund* in*

Dr.

To CASH EXPENDITURE.				Rs.	As.	P.	Rs.	As.	P.
Salaries ...	...	...	...	3,780	6	3			
Grain allowance ...	...	...	...	10	0	0			
Contingencies ...	...	...	...	33	13	3			
Binding ...	...	...	...	55	8	0			
Stationery ...	...	...	...	6	6	10			
Printing ...	...	...	...	97	8	0			
Light and Fan ...	...	...	...	2	15	3			
Insurance ...	...	...	...	31	4	0			
Books ...	...	...	...	103	7	1			
							4,121	4	8
Balance ...	...	...	...				6,177	3	10
TOTAL Rs.							10,298	8	6

* From an annual grant of Rs. 5,000, made by the Government of India and at present sanctioned for another two years only, for the cataloguing and binding of Arabic and Persian Manuscripts acquired by the Society for Government, for the purchase of further manuscripts, and for the preparation of notices of Arabic and Persian manuscripts found in various libraries in India.

STATEMENT 1916. *Bardic Chronicle Fund* in*

Dr.

To CASH EXPENDITURE.				Rs.	As.	P.	Rs.	As.	P.
Salary ...	...	...	...	5,500	0	0			
Balance ...	...	...	...				2,166	10	9
TOTAL Rs.							7,666	10	9

* From an annual grant of Rs. 6,000, made by the Government of India, for the salary of the Officer-in-Charge.

STATEMENT 1916. *Barclay Memorial Fund in Account*

Dr

				Rs.	As.	P.	Rs.	As.	P.
Commission for realising interest ...	...	...	...				0	11	5
To Balance--									
G.P. Notes (face value ...)	...	...	...	500	0	0			
Accumulated interest ...	...	...	...	53	1	7			
							553	1	7
TOTAL Rs.							553	13	0

No. 8.

Acct. with the Asiatic Soc. of Bengal. 1916.

Cr.

			Rs. As. P.
By Balance from last Report	...	...	5,298 8 6

BY CASH RECEIPT.

Government Allowance	5,000 0 0
----------------------	-----	-----	-----------

TOTAL Rs. ... 10,298 8 6

E. & O. E.

Calcutta, 31st December, 1916.

R. D. MEHTA, Hon. Treasurer.

No. 9.

Acct. with the Asiatic Soc. of Bengal. 1916.

Cr.

			Rs. As. P.	Rs. As. P.
By Balance from last Report	1,666 10 9

BY CASH RECEIPT.

Government Allowance	6,000 0 0
----------------------	-----	-----	-----	-----------

TOTAL Rs. ... 7,666 10 9

E. & O. E.

Calcutta, 31st December, 1916.

R. D. MEHTA, Hon. Treasurer.

No. 10.

with the Asiatic Society of Bengal. 1916.

Cr.

			Rs. As. P.	Rs. As. P.
By Balance from last Report—				
G.P. Notes (face value)	...	...	500 0 0	
Accumulated interest	...	...	37 9 6	
				537 9 6
Interest	...	...	...	16 8 6
TOTAL Rs.	...	...		553 13 0

E. & O. E.

Calcutta, 31st December, 1916.

R. D. MEHTA, Hon. Treasurer.

STATEMENT

1916. *Ind. Science Congress Fund* in Acct.*

Dr.						
To CASH EXPENDITURE.						
				Rs.	As.	P.
Contingencies ...	...	...	...	2	8	0
Stationery ...	...	...	...	10	12	0
Printing charges ...	...	...	...	79	6	9
Postage ...	...	...	...	12	2	0
Balance					104	12 9
TOTAL Rs.					780	7 3
					885	4 0

* From the subscriptions of members of the Congress.

STATEMENT

1916. *Building*

Dr.						
To CASH EXPENDITURE.						
				Rs.	As.	P.
Commission for realising interest ...	...	...	...		3	6 0
Balance ...	...	...	...	48,379	6	0
TOTAL Rs.					48,382	12 0

STATEMENT

1916. *Trust*

Dr.						
				Rs.	As.	P.
To Pension ...	...	...	...	32	0	0
„ Commission for realising interest ...	...	...	...	0	4	0
Balance ...	...	...	...	1,486	11	10
TOTAL Rs.					1,518	15 10

No. 11.

with the Asiatic Society of Bengal. 1916.

Cr.

BY CASH RECEIPTS.

		Rs. As. P.	Rs. As. P.
Amount received from Hon. Secretary Ind.			
Sen. Cong. in Feb. 1916	...		500 0 0
Subscription	...	385 0 0	
Discount for cashing cheque	...	0 4 0	385 4 0

TOTAL Rs.	...	885 4 0
-----------	-----	---------

E. & O. E.

R. D. MEHTA,

Hon. Treasurer.

Calcutta, 31st December, 1916.

No. 12.

*Fund.**1916.*

Cr.

By Balance from last Report	...	...	...	Rs. As. P.
				46,982 12 0
BY CASH RECEIPT.				
Interest	...	...	...	1,400 0 0
TOTAL Rs.	...	...	...	48,382 12 0

E. & O. E.

R. D. MEHTA,

Hon. Treasurer.

Calcutta, 31st December, 1916.

No. 13.

*Fund.**1916.*

Cr.

By Balance from last Report	...	...	...	Rs. As. P.
				1,469 15 10
Interest	...	...	...	49 0 0
TOTAL Rs.	...	...	...	1,518 15 10

E. & O. E.

R. D. MEHTA,

Hon. Treasurer.

Calcutta, 31st December, 1916.

STATEMENT

1916

Invest

Dr.

	Value.			Cost.		
	Rs.	As.	P.	Rs.	As.	P.
To Balance from last Report ...	2,59,300	0	0	2,56,163	8	10
TOTAL Rs.	2,59,300	0	0	2,56,163	8	10

FUNDS.	PERMANENT RESERVE.						TEMPORARY RESERVE.						Total.		
	Value.			Cost.			Value.			Cost.					
	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.			
Asiatic Society ...	1,67,000	0	0	1,65,685	9	8	42,000	0	0	40,199	3	2	2,05,884	12	10
Building Fund ...	48,400	0	0	48,379	6	0	...	...	...	...	...	...	48,379	6	0
Trust Fund ...	1,400	0	0	1,399	6	0	...	...	...	...	...	...	1,399	6	0
Barclay Memorial Fund	500	0	0	500	0	0	...	...	...	...	...	...	500	0	0
TOTAL Rs. ...	2,17,300	0	0	2,15,964	5	8	42,000	0	0	40,199	3	2	2,56,163	8	10

STATEMENT

1916.

Personal

Dr.

	Rs.	As.	P.	Rs.	As.	P.
To Balance from last Report	6,204	3	3

To CASH EXPENDITURE.

Advances for purchase of MSS. etc.	...	843	14	11		
To Asiatic Society ...	...	14,397	10	6		
„ Oriental Publication Fund, No. 1	...	2,356	6	0		
„ Sanskrit MSS. Fund	...	59	8	0		
					17,157	7 5

TOTAL	...	28,361	10	8
-------	-----	--------	----	---

No. 14.

ment.

1916.

Cr.

	Value.			Cost.		
	Rs.	As.	P.	Rs.	As.	P.
By Balance	2,59,300	0	0
				2,56,163	8	10
TOTAL Rs.	...	2,59,300	0	0	2,56,163	8

E. & O. E.

R. D. MEHTA,

Calcutta, 3rd December, 1916.

Hon. Treasurer.

No. 15.

Account.

1916.

Cr.

	Rs.	As.	P.	Rs.	As.	P.
By Cash Receipts	17,503	3
„ Asiatic Society	1,385	14
„ Oriental Publication Fund, No. 1	79	2

By Balance.	Due to the Society.			Due by the Society.		
	Rs.	As.	P.	Rs.	As.	P.
Members	4,027	6	8	127	4	0
Subscribers ... ..	...	...	...	96	0	0
Employés ... ..	...	...	...	100	0	0
Oriental Publication Fund, No. 1	432	0	0	...	...	...
Indian Science Congress ...	100	0	0	...	...	...
Miscellaneous	221	8	6	64	4	0
	4,780	15	2	387	8	0

TOTAL Rs.

4,393 7 2

23,361 10 8

E. & O. E.

R. D. MEHTA,

Calcutta, 31st December, 1916.

Hon. Treasurer.

STATEMENT

Cash

1916.

Dr.		Rs. As. P.	
To Balance from last Report	...	6,123	10 10
RECEIPTS.			
To Asiatic Society	...	10,314	15 0
„ Oriental Publication Fund, No. 1	...	9,766	10 6
„ Do. do. No. 2	...	3,000	0 0
„ Sanskrit Manuscripts Fund	...	3,203	8 0
„ Arabic and Persian MSS. Fund	...	5,000	0 0
„ Bardic Fund	...	6,000	0 0
„ Anthropological Fund	...	2,000	0 0
„ Bureau of Information and Cataloguing Sanskrit MSS.	...	3,600	0 0
„ Barclay Memorial Fund	...	16	3 6
„ Indian Science Congress	...	885	4 0
„ Building Fund	...	1,400	0 0
„ Trust Fund	...	49	0 0
„ Personal Account	...	17,503	3 6
			62,738 12 6
TOTAL Rs.	...	68,862	7 4

STATEMENT

Balance

1916.

LIABILITIES.		Rs. As. P.		Rs. As. P.	
Asiatic Society	...	1,87,803	15 6		
Oriental Publication Fund, No. 1	...	9,615	7 1		
Do. do. No. 2	...	8,109	3 0		
Do. do. No. 3	...	1,175	7 6		
Sanskrit Manuscripts Fund	...	4,649	4 2		
Arabic and Persian MSS. Fund	...	6,177	3 10		
Bardic Fund	...	2,166	10 9		
Anthropological Fund	...	2,484	7 6		
Bureau of Information and Cataloguing Sanskrit MSS.	...	3,000	0 0		
Barclay Memorial Fund	...	553	1 7		
Indian Science Congress	...	780	7 3		
Building Fund	...	48,379	6 0		
Trust Fund	...	1,486	11 10		
			2,76,381	6 0	
TOTAL Rs.	...	2,76,381	6 0		

We have examined the above Balance Sheet and the appended detailed accounts with the Books and Vouchers presented to us and certify that it is in accordance therewith, correctly setting forth the position of the Society as at 31st December, 1916.

CALCUTTA,
9th March, 1917.

MEUGENS PRAT & Co.,
Chartered Accountants, Auditors.

No. 16.

Account.

1916.

Cr.

EXPENDITURE.			Rs.	As.	P.	Rs.	As.	P.
By Asiatic Society	...	...	29,510	0	8			
„ Oriental Publication Fund, No. 1	...	...	4,728	10	9			
„ Do. do. No. 3	...	...	369	1	0			
„ Sanskrit Manuscripts Fund	...	...	4,321	15	5			
„ Arabic and Persian MSS Fund	...	...	4,121	4	8			
„ Bardic Fund	...	...	5,500	0	0			
„ Anthropological Fund	...	...	401	15	9			
„ Bureau of Information and Cataloguing	...	...				
„ Sanskrit MSS.	...	...	3,600	0	0			
„ Barclay Memorial Fund	...	...	0	11	5			
„ Indian Science Congress	...	...	104	12	9			
„ Building Fund	...	...	3	6	0			
„ Trust Fund	...	...	32	4	0			
„ Personal Account	...	...	343	14	11			
						53,038	1	4
„ Cash with Bank of Bengal	...	...	15,719	14	11			
„ „ „ Alliance Bank of Simla, Ltd.	...	...	53	1	7			
„ „ in hand	...	...	51	5	6			
						15,824	6	0
TOTAL Rs.						68,862	7	4

E. & O. E.

Calcutta, 31st December, 1916.

R. D. MEHTA, Hon. Treasurer.

No. 17.

Sheet.

1916.

ASSETS.

	Rs.	As.	P.	Rs.	As.	P.
Investments	2,56,163	8	10
Personal Account	4,393	7	2
Cash Account	15,824	6	0
				2,76,381	6	0

TOTAL Rs.

2,76,381 6 0

E. & O. E.

Calcutta, 31st December, 1916

R. D. MEHTA,

Hon. Treasurer.

Liabilities up to 31st December, 1916.

FUNDS.

					Rs.	As.	P.
Asiatic Society	...	...	...	...	2,595	0	2
Oriental Publication Fund, No 1	...	...	...	...	1,034	12	0
Do. do. No. 2	...	...	...	...	1,012	0	0
TOTAL Rs.				...	4,641	12	2

Copy of Certified Statement of Securities in Custody of the Bank of Bengal on account of Asiatic Society of Bengal, December 31, 1916 :—

3½ per cent. Loan of 1842-43	...	...	...	...	16,700
3½ " " " " 1854-55	...	...	...	...	1,53,700
3½ " " " " 1865	...	...	...	...	44,300
3½ " " " " 1879	...	...	...	...	8,000
3½ " " " " 1900-1	...	...	...	...	26,000
*3 " " " " 1896-97	...	...	...	...	500
4 " " Terminable Loan of 1915-16	...	...	...	...	10,100
TOTAL Rs.				...	2,59,300

[* Cashier's security deposit. — Ed.]

Copy of Certified Statement of Securities in Custody of the Alliance Bank of Simla, Ltd., on account of Barclay Memorial Fund, January 17, 1917 :—

3½ per cent. Loan of 1854-55	...	...	...	...	300
3½ " " " " 1854-55	...	...	...	...	100
3½ " " " " 1900-01	...	...	...	...	100
TOTAL Rs				...	500

Notes on Important Arabic and Persian MSS. found in various Libraries in India.—I.

INTRODUCTION.

In 1904 the Government of India accepted¹ the proposal of the President of the Asiatic Society of Bengal, made at the instance of Dr. E. D. Ross, C.I.E., to create a special Department for the institution of a systematic search for MSS. of Persian and Arabic works on behalf of Government, and indicated the two-fold object to which the efforts of this Department should be directed—viz. (a) the purchase of Arabic and Persian MSS., and (b) the search for and cataloguing of MSS. Large sums of money have been spent on the purchase of MSS. and a catalogue of MSS. acquired up to date is in the course of preparation under my supervision. Two Hand-lists of 1,646 MSS. have already been published. The first Hand-list is arranged alphabetically and deals with 1,106 MSS. acquired during 1904-7, while the second list deals with 540 MSS. purchased during 1908-10 and is grouped according to subjects. The catalogue under preparation is on the lines of the Catalogue of Persian and Arabic MSS. in the India Office Library by Dr. E. D. Ross and Professor E. G. Browne and supersedes the two Hand-lists just mentioned.

In 1912, at the instance of Major C. L. Peart who adopted the suggestion of his predecessor Col. D. C. Phillott, the then Officer-in-charge of the Search for the Arabic and Persian MSS., it was decided to apply the Search Fund rather to ascertaining the existence and whereabouts of rare and interesting MSS. than to purchasing them if in good keeping. In pursuance of this decision, Hâfiz Nazîr Ahmâd, the First Travelling Mawlavî, was directed to visit various libraries, book-stores, etc., scattered throughout India, and to prepare notices of MSS. The Mawlavî accordingly visited a number of libraries a list of which, with short description of each, is subjoined herewith.

The notices published in the following pages, which represent only in a small degree the labours of the Mawlavî in this direction, are prepared under my supervision from the notes made by him during his visits to the libraries. The whole work is divided into three sections, A, B and C, dealing respectively with Libraries, Arabic MSS. and Persian MSS. The notices are grouped according to subjects and arranged alphabetically under each subject, the Arabic MSS. coming first. The notices of Persian MSS., however, will be published in subsequent numbers of the proceedings of the Society.

¹ Government of India letter No. 880, dated the 14th June, 1904.

The notes are on unique, rare, and valuable MSS., on old MSS. written in or before the 9th century A.H., on autographs, copies of autographs, and such copies as bear sufficient testimony to their correctness, on MSS. written by eminent scholars or calligraphers, or bearing notes of Emperors, Kings or distinguished personages, on highly illuminated MSS., and works not noticed by Brockleemann in his *Geschichte der Arabischen Literatur*. Each notice contains the title of the work, name of the author, date of his death, date of composition of the work, subject-matter, the beginning and state of preservation of the MS., nature of hand-writing, date of transcription and the name of the scribe.

The contents of the libraries visited by the Mawlavi have not been fully examined. Much remains to be done. Besides the principal libraries, only a few of which the Mawlavi has visited, there are many small libraries, where valuable MSS. are stored away, which require to be inspected.

Remarks or criticisms on the notices themselves or of their arrangement are invited, and will be thankfully acknowledged, and suggestions for the improvement of the arrangement and classification will receive due attention.

The system of transliteration adopted in the following pages is that recommended by the Royal Asiatic Society with the slight variations indicated below :—

ط	=	t
د	=	d
ذ	=	z
ز	=	z
ص	=	s
ض	=	d
ط	=	t
ي	=	ay
و	=	aw

List of Abbreviations.

- A. S. B. = Asiatic Society of Bengal.
 Ah. = Ahmad.
 'A. = 'Abd al-
 Ar. = Arabic
 Br. Mus. Suppl. = British Museum Supplement.
 Brock = Brockleemann's *Geschichte der Ar. Litt.*
 Bodl. Lib. Cat. = Bodleian Library Catalogue.
 B. = Bin, Ibn (son of).
 Berl. = Berlin Arabischen Handschriften, Ahlwardt.
 b. = Born.

Cairo Lib. = Khedivial Library.

d. c. = Died circa.

Fihrist = Kitāb al-Fihrist by Md. B. Ishāq B. Abī Ya'qūb al-Nadīm. (d. A.H. 233 = A.D. 847).

Govt. Ind. Coll. = Government of India Collection.

H. Kh. = Hājī Khalfa's Lex. Bib.

Ha. = Hasan.

Hu. = Husayn.

Ind. Off. Lib. Cat. = India Office Library Catalogue.

Imp. Lib. = Imperial Library (Buhār Collection), Calcutta.

J.R.A.S. = Journal of the Royal Asiatic Society.

Lith. = Lithographed.

Md. = Muḥammad.

M. = Mawlavī

O.B.D. = Oriental Biographical Dictionary, Beale's.

O.P. Lib. = Oriental Public Library, Bankipūr.

Pers. = Persian.

Rawḍāt al-Jannāt = Rawḍāt al-Jannāt fi Aḥwālī'l-'Ulamā' i wa'l-Sādāt by Bāqir.

In conclusion, I wish to express my gratitude to the owners and superintendents of the libraries visited, and to those gentlemen who rendered all possible assistance to the Mawlavī in the discharge of his duties, particularly to Shams al-'Ulamā' Khān Bahādur Nawwāb 'Azīz Jang Nā'iṭi of Hyderabad, through whose influence the Mawlavī had access to several splendid libraries of Hyderabad and Madras, to Hāfiz Aḥmad 'Alī Khān, Superintendent of Rampore State Library, who rendered valuable assistance to the Mawlavī in the examination of MSS., Mr. Abu'l-Hasan Khān, Secretary, Oriental Public Library, Bankipore, and Mawlānā 'Abd al-Bārī of Lucknow.

I am also grateful to Dr. F. H. Gravely for his valuable suggestion as to the arrangement of the work, and to Mr. S. W. Kemp, Hony. Librarian of the A.S.B., for the encouragement and help given by him to the Mawlavī in the preparation of the notices.

A. AL-MA'MŪN SUHRAWARDY,

*Officer-in-charge of the Search for
Arabic and Persian MSS.*

A.

DESCRIPTIVE NOTES ON LIBRARIES.

LUCKNOW.

(1) *Mawlavī 'Abd al-Bārī Lib., Fīrangī Maḥall.*

The real founder of this library was Mullā 'A. Razzāq (*d.* A.H. 1295 = A.D. 1877) grandfather of M. 'A. Bārī, the present owner of the library and successor of the deceased. There are about 1,000 MSS. in the library, most of which are Commentaries on the Qur'ān, Tradition, Law, Theology, Belles-lettres, Theosophy and Philosophy. The library has a subject catalogue in MS. I have inspected almost all the MSS. with the exception of a few valuable MSS. locked up in book cases. The owner is engaged in writing a commentary on a well-known Sūfī work entitled *Fuṣūṣ al-Ḥikam* (فصوص الحکم) by Muḥyī al-Dīn B. al-'Arabi.

(2) *M. 'Abd al-Ḥayy Lib., Fīrangī Maḥall.*

This library was founded by Mullā 'A. Ḥakīm (*d.* A.H. 1258 = A.D. 1842), father of M. Abu'l-Hasanāt A. Ḥayy (*b.* A.H. 1265 = A.D. 1848; *d.* A.H. 1304 = A.D. 1886), the celebrated modern Oriental *savant* who died in the prime of life at the age of 39 years.¹

The library is now under the control of Muftī Md. Yūsuf, the son-in-law of the Mawlavī, and is not open to the public. It has a good collection of Arabic and Persian MSS. and has a subject catalogue in MS.

(3) *Nāṣir Ḥu. Muṭahid Lib., Khajwah.*

This library is well known in Lucknow, and was founded by M. Ḥamid Ḥu., father of the present owner. The library is reserved for the Shī'ahs. I had access to it through the influence of some Shī'ah gentlemen, and could inspect only a few MSS. with much difficulty. The library appeared to have a fine collection of MSS. When I again went to Lucknow with the main object of visiting the library in question with a letter of introduction from the Society to the Commissioner, I was informed on my arrival at Lucknow that the Commissioner had left for the hills. I could not therefore visit the library again.

¹ See *Aḥwāl-i-'Ulamā-i-Fīrangī Maḥall* for lives of M. 'A. Razzāq, 'A. Ḥalīm, 'A. Ḥayy, and 'A. Bārī.

The library has a catalogue, but the public are not allowed to see it.

(4) *Nadwat al-'Ulamā' Lib.*

This library is situated at Golāganj and was founded (A.H. 1328 = A.D. 1910) by Shams al-'Ulamā' Shiblī Nu'mānī (d. A.H. 1333 = A.D. 1914). It is in a very good condition and contains mostly printed works, arranged in 32 big book cases. I could not fully inspect its contents as it was closed before I could do so, on account of some festival. For fuller details vide *al-Nadwah* 1910, No. 7, p. 3, and No. 11, pp. 31-33.

(5) *M. Ḥakīm 'A. Ḥayy Lib.*

This library is situated at Aminābād and has a fine collection of MSS. I found the owner engaged in writing three voluminous and interesting works in Arabic namely—

١ - ذبقة الخواطر و بهجة المسامع و الدواظر *

٢ - جذة المشرق و مطلع الذور المشرق *

٣ - العوارف لأنواع المعارف *

The above works are now complete, and are noticed below (see Nos. 140, 143 and 148).

(6) *Nawwāb Sayyid Nūr al-Ḥasan Lib.*

This library is situated at Ghasyārī Mandī, and had formerly a large collection of MSS., but owing to some difference among the family members, its contents have been divided and taken away. Now it contains mostly printed books and about 100 MSS. I could not inspect the library owing to the absence of the Nawwāb Ṣāhib, the owner.

(7) *Tahsīn Lib., Chawk.*

This library is situated behind Tahsīn Masjid. It has about 1,500 MSS. mostly by Shī'ah authors. It is in a bad condition. The owner is Md. Ibrāhīm who belongs to a well-known Shī'ah Mujtahid family.

(8) *Shāh Ḥabīb Ḥaydar Lib., Kākūrī.*

This library has about 500 MSS., and is in good order. It is especially rich in Sūfī works.

There is also a considerable number of printed works, and every facility is offered to visitors for inspection. The owner belongs to a distinguished family of Sūfis. Vide *Al-Matāwārī fī ḥālī Niẓām al-Dīn al-Qārī* by Shāh Turāb 'Alī, father of the owner.

(9) *Mirzā Md. 'Alī Khān Lib., Victoriaganj.*

This library has about 300 MSS., but none of much interest. The greater number of MSS. are by Shī'ah authors. It has a catalogue in MS.

(10) *Sakhāwat Husayn Lib., Nakhkhās.*

This library contains about 250 MSS. and many printed books. None of the works are of any exceptional interest.

The two book-sellers referred to by Mr. H. Beveridge in his article in the J.R.A.S. 1901 are still living. I met them at Lucknow and purchased from them some MSS. for the Government Search Department. Besides these two, there are other book-sellers who also supplied the Department with MSS. Lucknow is the only city in Upper India where valuable MSS. are available, as Mr. Beveridge has also remarked in his article.

BENARES.

(11) *M. Md. Khaṭīb al-Dīn Aḥmad Lib., Salāmpūrah.*

The above library has 200 MSS. which are in a state of decay for want of proper care due to family differences. On account of my short stay at Benares I could not visit other libraries.

There is a book-seller in the town from whom MSS. were purchased for the Department.

MADRAS.

(12) *Ahl-i-Islām Lib.*

This library was established (A.H. 1266 = A.D. 1850) by Nawwāb Ghulām Ghawṭh¹ Khān Bahādur of Carnatic and is open to the public. It is situated in a good quarter of the town. The library and the reading-rooms are upstairs. Government contributes to the library Rs. 35 monthly from the pension of the Nawwāb. The control of the library is in the hands of a managing committee consisting of Muhammadan members only. The library contains about 225 MSS. and has an ordinary printed Catalogue in Urdū.

(13) *Shams al-'Ulamā' Qāḍī 'Ubayd-Allāh Lib., Roypetta.*

This is a popular library in Madras, and was founded by Qāḍī'l-Mulk Badr al-Dawlah Bahādur (d. A.H. 1289 = A.D. 1863). It has about 300 MSS., mostly on literature, jurisprudence and logic, and many printed books. It is in good order and accessible to all.

¹ See for Ghulām Ghawṭh (poetically called "A'zam") *Subh Waṭan* (comp. 1257 A.H. = 1841 A.D.), p. 3, and *Gulzār A'zam* (comp. 1269 A.H. = 1852 A.D.), p. 62. Both the works compiled by himself.

(14) *Nawwāb Ihtishām al-Dawlah Lib.*

This library contains about 200 MSS. and many printed books. It is in good condition and is under the control of the sons of the deceased Nawwāb. It is located in spacious rooms on the second storey.

(15) *Hājī Habīb-Allāh Lib., Nellore.*

This library containing 445 MSS. and 1,024 printed books, is in a very good condition. All the MSS. are well arranged and carefully preserved. The collection of MSS. on Sūfi-ism is particularly valuable. The library is situated in a fine locality of the town. It has a Catalogue in MS. The owner is willing to sell the library.

HYDERABAD, DECCAN.

(16) *Nawwāb Maḥbūb Yār Jang Lib., Sayjābād Road.*

This library was originally founded by the above-mentioned gentleman, and is at present under the control of his son Sartāj Jang. There are about 900 MSS. in this library and 3,099 Arabic and Persian printed books. The MSS. are kept in a pell-mell condition, and no proper care of the library is taken by the owner, who is willing to sell it off at Rs. 12 per volume of MS. I could not fully inspect the library, as it was closed owing to the indisposition of the Nawwāb Ṣāhib. The library has an ordinary printed Urdū Catalogue.

(17) *Mawlāṅ Sayyid 'Alī Husayn Bilgrāmī Library,
Kūchah-i-Madrasah-i-A'izzah.*

This library, containing 1,082 MSS., is in a very good condition and possesses a valuable collection of MSS. It also contains autographs and fine specimens of calligraphy seldom found in other libraries. The owner is very fond of acquiring more MSS. The library has an excellent MS. Catalogue in Persian.

(18) *Mullā 'A. Bāsīt Lib., Chādarghāt.*

This is a popular library in Hyderabad founded by late Mullā 'Abd al-Qayyūm, father of Mullā 'A. Bāsīt, the present owner, and contains 551 MSS. The owner is willing to sell it at a reasonable price.

(19) *H.H. The Nizām's State Library.*

This grand library opened to the public in A.H. 1307 = A.D. 1889, contains 15,000 Arabic, Persian and Urdū works (printed and MS.). It receives an annual grant of Rs. 12,000 from the Nizām's Government, of which Rs. 4,000 are reserved for the

purchase of Arabic and Persian MSS. and printed books. It is a pity there is no proper Catalogue of the MSS. in this splendid State Library. An ordinary Urdū Hand-list is the only index to the valuable and interesting collection of Oriental works. It is absolutely of no use to the scholar in making any research.

I hope H.H. the Nizām will see that a proper Catalogue of his library on modern lines is prepared ere long for the benefit of scholars.

Sir Sālār Jang's Library which ranks next in respect of rare works was visited by Mr. Beveridge. Unfortunately I was unable myself to visit it, and owing to lack of time my examination of the State Library was incomplete.

Hyderabad is also a good hunting-ground for Arabic and Persian MSS. Besides the libraries containing the MSS. there are many book-sellers who offer MSS. for sale. A few of them have already supplied MSS. to the Government Search Department.

RAMPORE.

(20) *Shāh Muḥammad Muḥaddith Library.*

This library was founded by the father of the present owner Shāh Hasan Muḥaddith, both well-known '*Ulamā*' of Rāmpore. Besides printed works the library has 200 Arabic and Persian MSS.

The books are well arranged in shelves. Most of the works are gifts from disciples.

The library has a Hand-list in MS. according to subjects.

(21) *Hāfiẓ Aḥmad 'Alī Khān Library, Kūchah-i-Langar Khānah.*

This library was founded by the owner's father Asghar 'Alī Khān, Nāzim of Rāmpore State (d. A.H. 1321 = A.D. 1903).

It contains 500 books and MSS. and a MS. list of the same. The works are systematically arranged according to the list.

The owner is the superintendent of the Rāmpore State Library and of His Highness' Household.

(22) *Rāmpore State Library.*

Full details of this library and the notices of its Arabic and Persian MSS. will, it is hoped, be published next year.

(23) *Oriental Public Library, Bankipore.*

I stayed about two weeks in this library which owes its origin to Mawlavī Md. Bakḥsh Khān, who, at the time of his death in July, A.D. 1876 (= A.H. 1294), left a collection of 1,400 volumes. Md. Bakḥsh was a lawyer of Bankipore. Though not a rich man,

he had a passion for Arabic and Persian books and succeeded in adding 1,200 MSS. to the 300 which he had received by inheritance. On his death-bed he charged young Khudā Bakhsh to complete the collection in every branch of Oriental learning and to build a library-hall for the use of the public.

In 1891 the library, which then contained nearly 4,000 MSS., was opened to the public. At the present time the number, as I found after careful inquiry, is about 5,130 (Arabic, 3,050; Persian, 2,030; and Urdū, 50), though it is stated in the preface to the first volume of the O. P. Library Catalogue that it exceeded 6,000. The library also contains about 3,000 Arabic and Persian printed books.

In the year 1915, a Muhammadan gentleman of Patna presented 130 Arabic and Persian MSS. and about 400 Arabic and Persian printed volumes.

The additions made since the library was first opened are entirely due to the son of Mawlavī Md. Bakhsh, Khān Bahādur M. Khudā Bakhsh Khān, C.I.E., who died in the year 1908 (= A.H. 1325). It is to him that the library in its present form owes its existence.

The founder spent a large sum of money on the library buildings. It is a two-storied structure with a spacious hall and two side-rooms on the first floor and wide, shady verandahs. Most of the lower rooms are paved with marble or stone mosaics; in the other verandahs and rooms the floor is covered with encaustic tiles. The single-storied reading-hall was built at Government expense.

Since 1891 the Government has granted a monthly sum for the maintenance and proper guarding of the library. H.H. the Nizām contributes Rs. 600 a year towards its upkeep.

In 1903 that great patron of learning, Lord Curzon, honoured the library with a visit and was pleased to make the following remark: "While at Patna I inspected with great pleasure the library which the liberality of Khudā Bakhsh has presented the public, and I was shown many of the rare and valuable treasures which it contains.

"I discussed with the generous donor the means by which the collection may be preserved from risk of fire or any other danger and by which its advantages may be made even more accessible than they now are to the reader and student. I hope that steps may be taken in both of these directions."

In view of the fact that this splendid collection was almost unknown in Europe, and not nearly so well known as it deserved to be among the learned Muhammadans of India, Lord Curzon realised the urgent need of a detailed Catalogue of the library and at His Excellency's request the Government of Bengal undertook to provide funds for the purpose.

Formerly Khān Bahādur Mawlavī Khudā Bakhsh, C.I.E., compiled a descriptive catalogue of many of his MSS. It is

entitled the *Mahbūb al-Albāb*. Written in Persian and lithographed at Hyderabad in the Deccan when he was Chief Justice there: it is dated A.H. 1314 = A.D. 1896.

After the death of the founder, a descriptive Catalogue of Persian poetry in three volumes was compiled by Khān Sāhib M. 'Abd al-Muqtadir who is at present working on the historical MSS.

The first volume deals with the poets from Firdawsī to Hāfiz, the period thus covered extending from the 11th to the 14th centuries of the Christian era. The second volume includes the works of the poets of Irān, Tūrān, and Hindustān, who flourished during the 15th and 16th centuries. The third volume completes the description of the works of Persian poetry contained in the library, and deals with poets, both Persian and Indian, who flourished during the 17th, 18th and 19th centuries. The 4th volume, dealing with the Arabic works on medicine, was prepared by Dr. 'Azīm al-Dīn Aḥmad, Ph.D.

The chief feature of the collection is that, apart from being full of ancient Arabic works on medicine, it is according to Dr. Ross "even richer in the writings of Indian authors who have done so much for the collection and preservation of older works and the adaptation of the ancient system of medicine to their own surroundings and requirements."

Another volume on Arabic MSS. on Tradition, compiled by M. 'Abd al-Hamīd, is in the press. A hand-list of the Arabic and Persian books and MSS. is also in course of publication by the same Mawlavī.

For notices on the library, *vide* Mr. Beveridge's *Notes on Persian and Arabic MSS. in Indian Libraries* (J.R.A.S., for 1901, p. 80), Mr. E. G. Browne's article in the J.R.A.S. 1910, p. 207, Eastwick's *Handbook for Bengal* (Murray), the preface to Vol. I of the *Bankipore O.P. Library*, written by Dr. E. Denison Ross, Ph.D., C.I.E., the preface to the *Rampore State Library Urdū Catalogue* (page 2). For fuller details see the *Life of Khudā Baksh*, founder of the library, by his eldest son Mr. S. Khudā Baksh, M.A., B.C.L. (Oxon), Bar.-at-law, and *Anecdotes of Aurangzēb, Historical Essays*, pp. 227-242, by J. N. Sarkar, M.A., Professor, Patna College.

(24) *Muradabad Library.*

This is a small library containing about 50 MSS. It belongs to Munshī Aḥmad-Allāh of Rampore who is desirous of disposing of it. Owing to my stay at Muradabad for a day only, I could not see the other libraries of the city.

(25) *Buhār Library, Burdwan.*

The above library was founded by Munshī Sayyid Ṣadr al-Dīn, who died in A.H. 1211 = A.D. 1796, at Buhār in Burdwan.

The library was attached to the famous Madrasah-i-Jalāliyah founded in A.H. 1189 = A.D. 1775, as appears from the following chronogram:—

کرد چون تعمیر صدر دین مبارک مدرسه
شد اساس علم قائم زین مبارک مدرسه
خواستیم تاریخ سالش حضرت والا عزیز
علویان گفتند روشن این مبارک مدرسه
(۱۱۸۹)

The Madrasah-i-Jalāliyah, which is known to all, enjoyed a wide celebrity under the principalship of the eminent scholar and most prolific Indian writer Mawlavi¹ 'Abd al-'Alī Md. B. Nizām al-Dīn of Lucknow, popularly known as the *Bahr al-'Ulūm* (d. A.H. 1225 = A.D. 1810).

The Madrasah was named after Sayyid² Jalāl al-Dīn Tabrizī (d. A.H. 642 = A.D. 1244) who came to Bengal and was granted the tenure of the Bā'is Hazārī Parganas. The first Šadr al-Dīn became the Wāqif of the trust estate and he founded the Madrasah and the library by its income. The name of the Madrasah-i-Jalāliyah is written on the fly-leaves of many MSS., from which it may be inferred that the library was attached to the Madrasah.³ Most of the contents of the library were lost after the death of the first Šadr al-Dīn, the founder, and during the minority of his only son Kafil al-Dīn (d. A.H. 1243 = A.D. 1827) whose estate was taken charge of by the Court of Wards. On his attaining majority the estate reverted to him. It cannot be ascertained how many MSS. he obtained when the estate devolved upon him. Kafil al-Dīn was succeeded by his son Sayyid Karīm al-Dīn Aḥmad (d. B.S. 1262 = A.D. 1856 = A.H. 1273).

It is not known how the founder of the library, the first Šadr al-Dīn, collected the MSS. and what was their number, but when the second Sayyid Šadr al-Dīn Aḥmad succeeded his father Karīm al-Dīn he found only one hundred volumes of MSS. He added much to the library by purchase and by copying from other MSS. found in different libraries in India. He was himself a patron of learning and author of many books and had a special taste for the Persian language.

In the year 1904, during the viceroyalty of Lord Curzon, the library was presented by the owner, the second Šadr al-Dīn

¹ For his life see *Aḥwāl-i-Ulamā'-i-Fīrangī Maḥal*, p. 64, *Ḥadā'iq al-Hanafīyah*, p. 467, O.P. Lib. Bankipore Cat., Vol. I, p. 117, where the date of Bahr al-'Ulūm's death is given A.H. 1235, and *al-Nadwah*, 1910, No. 12, pp. 14-18.

² For his life see *Rawā'ih al-Mustafā*, p. 298, compiled by M. Sayyid Šadr al-Dīn Aḥmad al-Mūsavi and *Khazīnat al-Ashyā* of Ghulām Sarwar, p. 262.

³ For Madrasah see *al-Nadwah*, 1910, No. 12, p. 16, and *Tazkirah 'Ulamā' i Hind*, p. 123.

(who died in B.S. 1312 = A.D. 1905), to the Government of India and was incorporated with the Imperial Library under certain conditions. It contains 468 Arabic MSS., 522 Persian MSS., and 1,500 printed works, representing the various branches of Muhammadan literature.

It appears from Mr. Beveridge's article (J.R.A.S. of 1901, p. 82) that when he visited the library to find another copy of *Gulbadan Begam's Memoirs*, which was the main object of his journey, he saw only two beautifully illuminated Persian MSS. amongst others in the library, namely *Shāhnāmāh* and *Hakīm Sanā'ī's* famous work. In the contents of the library there are now several interesting, rare and old MSS.

In conclusion, I take the opportunity to express my indebtedness to Mawlavi Sayyid 'Abd-Allāh al-Mūsavi, B.A., son of the second M. Sayyid Šadr al-Dīn, for the very valuable information that he gave me regarding the library. Owing to the complete absence of records it would have been impossible for me to have learnt the facts from any other source.

B.

NOTES ON IMPORTANT ARABIC MSS.

I.

THE QUR'ĀN.

1.

قرآن شریف بخط یاقوت مستعصمی

A valuable copy of the *Qur'ān Sharīf*, written by Yāqūt Musta'simī, the celebrated calligrapher, who died in 698 A.H. The first half of the copy is unfortunately missing. There are thirteen lines to a page, of which three are written in bold Naskh. Each of the first two lines in bold Naskh is followed by five lines written in small Naskh.

It appears from the colophon that Yāqūt finished this copy in 601 A.H. Illuminated throughout. For another copy by the same scribe see O.P. Lib. Ar. Hand-list No. 6. A complete copy by the same scribe is in the Ihtishām al-Dawlah Lib., Madras, and another copy is mentioned in E. Blochet's Catalogue de Collection de Manuscrits Orientaux No. 6082. See J.R.A.S. 1901 A.D., p. 334, No. 5961.

Beg :—

و منها نخرجکم تارةً أخرى آلیة

(Wājid Hu., Yahyāganj, Lucknow.)

2.

A valuable and beautiful copy of the *Qur'ān Sharīf*¹ written on deer skin by Dārā Shikūh, son of Shāh Jahān (d. 1069 A.H. = 1658 A.D.), in A.H. 1051 :—

کتبه بندقه اکثم دارا شکوه بن شاهجهان بادشاه غازی در مقام شاه جهان
آباد - سنه ۱۰۵۱ هـ

¹ Vide Proceedings of the A.S.B. for 1870, p. 251, where a MS. copy entitled "*Mathnawī Sultān Walad*" in the handwriting of this prince is mentioned by Blochmann.

The verses of the *Qur'ān* are written throughout in gold. The headings are illuminated with fine floral designs and the copy is beautifully illuminated throughout. The MS. is carefully preserved in a splendid binding.

(‘Azīz Bāgh, Hyderabad.)

3.

A complete copy of the *Qur'ān*, with interlinear Persian paraphrase. This copy is of historical interest. It was written by Sayyid ‘Alī of Shīrāz for Nūr Jahān, the favourite wife of the Emperor Jahāngīr. The text is written in large Naskh and the paraphrase in Nasta‘liq. Dated 1024 A.H.

(Wājid Ḥu., Yaḥyāganj, Lucknow.)

4.

A valuable *Qur'ān Sharīf*, written in very good Naskh by ‘Abd-Allāh Tabbākḥ (d. c. 900 A.H. = 1494 A.D.). He is mentioned among the great penmen, who lived in the reign of Sultān Ḥu. (A.H. 873—911 = A.D. 1468—1505). See Br. Mus. Pers. Cat., Vol. I, p. 6b.

Each verse and the names of Sūrahs are illuminated with gold.

The following three seals are found on the last page:—

- (۱) یمین الدین علی امجد خان فدوی احمد شاه بهادر غازی
(۲) کاظم علی خان بهادر فدوی بادشاه غازی شاه عالم - سنه ۱۱۷۶
(۳) حیدر علی خان غازی (فدوی) بادشاه غازی محمد شاه.
(M. ‘Alī Ḥu. Lib. Kūchah-i-Madrasah-i-A‘izzah, Hyderabad.)

II.

VARIOUS READINGS AND ORTHOGRAPHY OF THE QUR‘ĀN.

5.

خزانة الرسوم

A treatise on the various readings of the *Qur'ān*, by Khwājah Muhammad B. Mullā Md. Raḥīm-Allāh. The author dedicated the work to Sayyid Subḥān Qulī Md. Bahādur Khān.

Copies of the work exist in the Nizām Library, Hyderabad, Shams al-‘Ulamā ‘Ubayd-Allāh Library in Madras, and M. ‘A. Bārī Lib., Firangī Mahall, Lucknow. The work and the author are not mentioned in Brock.

Written in elegant Naskh. (C. 1200 A.H.)

Beg:— اعتصامي (بک) یا کریم باب فی اصول المرسومات

6.

رسالة في القراءة

A versified treatise on the various readings of the *Qur'ān* by Tāhir al-Hāfiẓ al-Iṣfahānī.

Written in elegant Naskh. (C. 1000 A.H.).

Beg: — يقول الفقير إلى الله الغني طاهر الحافظ الإصفهاني

(M. 'A. Bārī Lib., Firangī Maḥall, Lucknow.)

7.

زبدة البيان في رسوم مصاحف عثمان

A treatise on the orthography of the *Qur'ān* by Md. B. 'Alī, B. Nūr al-Dīn al-Kirmānī of Mecca. It is divided into ten chapters.

Written in good Ta'liq. (C. 1200 A.H.).

Beg: — الحمد لله الذي شرفنا بالإيمان وعززنا بالإسلام والاحسان

(Nizām Lib., Hyderabad.)

8.

كتاب الائتلاف في وجوه الاختلاف

A work treating of the various readings of the seven recognised *Qur'ān*-readers, by 'Abd-Allāh B. Md., known as Yūsuf Effendi. It deals exclusively with those words or passages in which variants occur. Written in Naskh. (C. 1200 A.H.).

Beg: — الحمد لله ... إما بعد فيقول العبد الفقير ... اعلم انه روى بعضهم عن يعقوب في النون المقدوحة.

(M. 'A. Bārī Lib., Firangī Maḥall, Lucknow.)

9.

ناسخ القرآن ومنسوخه

A work treating of the abrogating and abrogated verses of the *Qur'ān* by Abū 'Abd-Allāh B. Md. B. 'Abd-Allāh B. 'Alī al-Isfarā'īnī.

Written in Naskh (C. 1200 A.H.).

Beg: — الحمد لله الذي مستحق لذاته وصفاته وهدانا إلى

(M. 'A. Bārī Lib., Firangī Maḥall, Lucknow.)

III.

COMMENTARIES ON THE QUR'ĀN.

10.

تفسير محمد بن اسمعيل الامير اليميني الصنعاني

A rare collection of the following four treatises:

(1) A Commentary on different chapters of the *Qur'ān* by Md. B. Ismā'il (d. 1182 A.H. = 1768 A.D.). Author mentioned in Brock. See vol. II, p. 400. It is an autograph copy, according to a note on the fly-leaf:—

توفى السيد محمد بن اسمعيل مؤلف هذه الرسالة وكتب هذا الهامش
الاعلا والهوامش التي على الرسالة توفى ظهر يوم الثلاثاء ثالث شعبان سنة
اثنى عشر وثمانين ومائة و الف - ودفن في المحوطة جنب موهبة الامام
شرف الدين في صنعاء - وكانت ولادته سنة ١١٠١ فعمرة اثنان وثمانون.

Preface begins thus:— قال الوالد الامام بدر الاسلام ...
محمد بن اسمعيل صلاح الامير قدس الله تعالى.

Written in careless Naskh. Dated 1137 A.H.

الاستظهار على البحرو المنار

(2) A work on jurisprudence by the same author.

Beg:— قول البحر - مسئلة ولا يجوز خلو لزمان عن مجتهد الخ

Written in careless Naskh. Dated 1183 A.H.

(3) A treatise on jurisprudence without preface and title, by the same author. Careless Naskh. Dated 1188 A.H.

Beg:— الحمد لله ... سألتكم ... عن سوالات الخ
(4) نيقاط الفكرة.

On Sūfism, by the same author. Same Naskh. (c. 1200 A.H.). The last three treatises are written by the son of the author of the first.

(Nizām Lib., Hyderabad.)

11.

التهذيب في التفسير

A Commentary upon the *Qur'ān*, by Abū Sa'd Muḥsin B. Karāmat al-Jashamī al-Bayhaqī, who flourished in the 5th century of the Muhammadan era. See Brock., Vol. I, p. 412.

Vol. II comprises the commentary from آل عمران up to قال انظروني الى يوم يوم والمحصنت. A copy beginning from the verse سورة الاعراف (chap. 7, v. 13) and carried down to the verse سورة يونس (chap. 10, v. 34), dated 674 A.H. = A.D. 1275, is preserved in the A.S.B., in the Govt. Ind. Coll. (see Hand-list, Part II, p. 1, No. 2). All the volumes excepting the VI, which is dated 627 A.H. = A.D. 1229, are written in a modern hand. H. Kh. saw a vol. dated 652 A.H. = A.D. 1254, as he says, in Vol. II, p. 482:—

رايت نسخة منها مكتوبة مورخة سنة ٦٥٢

The Commentary deals with the various readings of the *Qur'ān*, vocabulary, syntax, sense, substance, time and place of revelation and arrangement of the verses. H. Kh. says with reference to the work:—

تسرة بالقول - ذكر القراءة أولاً ثم اللغة ثم الاعراب ثم المعنى ثم الاحكام

For other copies *vide* Brock., Vol. I, p. 412.

(This MS. was bought in 1914 by the O. P. Lib., Bankipur, from 'Abd al-Hu., Mahallah Dargāh, Lucknow.)

12.

كتاب الصراط المستقيم

A Commentary upon the *Qur'ān* by Md. B. Md. Hadar, better known as Nūr al-Dīn Aḥmad B. Md. Kāzarūnī wa'l Shāfi'ī (d. c. 918 A.H. = 1512 A.D.).

A note on a fly-leaf says that the author was martyred when Sultān Salīm I (d. A.H. 926 = A.D. 1520) entered Egypt. Written in Naskh with marginal notes. Dated 980 A.H. Illuminated 'Unwān.

Beg: — عوذ بالله من الشيطان الرجيم من الجنة والناس الخ -

(Nizām Lib., Hyderabad.)

13.

كاشف الحقائق

A Commentary upon the *Qur'ān* according to Šūfī doctrines, by Md. B. Aḥmad B. Md. al-Sharīḥī al-Thānisarī al-Gujrātī.

For another copy see A.S.B. Ar. Cat., p. 3.

Scribe:—Zāhid. Written in elegant Naskh. Dated 1194 A.H.

Beg: — الحمد لله الذي انزل على حبيبہ القرآن وجعله هاديا

(M. 'A. Bārī Lib., Firangī Maḥall, Lucknow.)

14.

الكشف والبيان

A Commentary upon the *Qur'ān*, by Aḥmad B. Md. B. Ibrāhīm al-Tha'labī al-Naysābūrī (d. A.H. 427 = A.D. 1036). See Brock., Vol. I, p. 350, H. Kh., Vol. V, p. 217.

The library has only the latter half of the Commentary, slightly imperfect at the end. An old copy (c. 600 A.H.) written in Naskh. For other copies *vide* Brock., Vol. I, p. 350. An incomplete copy exists in the Rampore Lib. See Cat. of the same, p. 24. For another copy see Hand-list of Govt. Collection, A. S. B., Part 1, p. 13, No. 207.

(M. 'A. Bārī Lib., Firangī Maḥall, Lucknow.)

15.

الكوكبين النيرين

An extensive glossary in four volumes upon the well-known تفسیر جلالین of Jalāl al-Dīn Md. B. Aḥmad al-Maḥallī (d. A.H. 864 = A.D. 1459) and Jalāl al-Dīn 'A. Raḥmān al-Suyūfī (d. A.H. 911 = A.D. 1505).

Author:—Aṭīyat-Allāh B. 'Aṭīyah al-Ujhūrī (d. A.H. 1190 = A.D. 1776). For another copy entitled حاشية على الجلالين consult Brock., Vol. II, p. 329.

Written in Naskh. (C. 1200 H.).

Beg:—الحمد لله الذي أنزل على عبده الكتاب ناطقاً بالحكمة
وفصل الخطاب.

(M. 'A. Bārī Lib., Firangī Maḥall, Lucknow.)

16.

لطائف الاشارات

An extensive and rare Commentary upon the *Qur'ān* by Abu'l-Qāsim 'A. Karīm B. Hawāzin B. 'A. malik B. Talḥah B. Md. al-Qushayrī (d. A.H. 465 = A.D. 1074). Brock., Vol. I, p. 432, for another copy see Ar. Hand-list O.P. Lib., No. 312, p. 32. Composed in 437 A.H. as author says:—

ابتداء هذا الكتاب في شهر سنة سبع وثلثين واربعمائة

Vide H. Kh., Vol. V, p. 313.

Written in Naskh. Dated 727 A.H.

(Mullā 'A. Bāsīt Lib., Chādarghāt, Hyderabad)

17.

نور الثقلين

An extensive *Shī'ah* Commentary upon the *Qur'ān*, by 'A. 'Alī B. Jumū'ah 'Arūsī Huwayzī (d. c. A.H. 1100 = A.D. 1688). Written and compared with the author's copy in the lifetime of the author as written on the margin at the end:—

قوبل من اوله الى آخره بنسخة المؤلف دام ظله بحسب الجهد والاطافة

Copied by Hu. B. Md. B. Muslim, written in Naskh in the Lib. of the Madrasah-i-Huwayzīyah in *Shirāz*, dated 1076 A.H.

وقع الفراغ من كتابته يوم الجمعة ثامن عشر شهر الله رمضان و (من) شهور السنة السادسة والسبعين بعد لالف من هجرة من لا نبى بعده - على يد الفقير حسين بن محمد مسلم في دار العلم شيراز في مدرسة

الحوزية. See *Rawḍāt al-Jannāt*, p. 358.

According to Brock., Vol. II, p. 412, only one copy exists in Europe, in the Lib. of Ind. Off. For another copy see O.P. Lib. Ar. Hand-list No. 347, p. 34. There is an imperfect copy in the Imp. Lib.

Beg:—

الحمد لله الذي نزل الخ

('Abd al-Hu., Maḥallah Dargāh, Lucknow.)
(Bought in 1914 by the State Lib., Rampore.)

IV.

TRADITIONS.

18.

اتكاف المهرة في اطراف العشرة (في الحديث)

An extensive collection of authentic traditions from the canonical works *مسانيد اربعة* and *كتب ستة*. See H. Kh., Vol. I, p. 150.

Author:—Abu'l Faḍl Aḥmad B. 'Alī B. Md. B. Hajar Shihāb al-Dīn al-'Asqalānī al-Shāfi'ī (d. A.H. 852 = A.D. 1449). For author see Brock., Vol. II, p. 67.

The grandson (daughter's son *سبط المؤلف*) of the author. Yūsuf B. Sāhī (يوسف بن ساهي) states at the end of 3rd vol. in part 5th, that he finished the transcription of this copy on the 12th Jumādā II A.H. 868:—

ورافق الفراغ من نسخ هذه النسخة صبيحة يوم الامس (ا.) ثاني عشر

جمادى الآخرة سنة ٨٩٨ على يد فقير رحمة ربه تعالى يوسف بن
ساحي سبط مؤلفه عفى (عفا) الله تعالى عنهم اجمعين.

Written in old Naskh. Rare, valuable copy.

(Nizām Lib., Hyderabad.)

19.

خلاصة البدر المنير في تخريج احاديث الشرح الكبير

An autograph copy of the abridgment of *Badr al-Munir*, on Shāfi'i jurisprudence. This is a commentary on *وجيز* the well-known work of Md. B. Md. al-Ghazzālī al-Shāfi'i (d. A.H. 505 = A.D. 1111): see H. Kh., Vol. VI, p. 427.

Author:—Alī B. Ahmad B. Md. Sirāj al-Dīn B. al-Mu-laqqan al-Ansārī al-Andalūsī (d. A.H. 804 = A.D. 1401). For author see Brock., Vol. II, p. 92; H. Kh., Vol. VI, p. 429. For another copy see Berl. Lib. Ar. Cat. No. 10039.

It is divided into four volumes, as H. Kh. says :
ثم لخصه في أربع مجلدات وسماه الخلاصة
Only last volume exists
in this lib. Written in Naskh. Dated 749 A.H.

(Nizām Lib., Hyderabad.)

20.

رسالة في الحديث

A treatise on tradition.

Author:—Md. Tāj al-Dīn B. 'Abd al-Muhsin al-Qalā'i. (?)
Autograph copy. Written in good Naskh.

Beg:— الحمد لله الذي اعلا (اعلى) اعلام السنة النبوية الخ

(M. 'Alī Ḥu. Lib., Kūchah-i-Madrasah-i-A'izzah, Hyderabad.)

21.

رياض الصالحين

A short collection of genuine traditions which are calculated to lead one to a moral and pious life.

Author:—Muḥyī al-Dīn Abū Zakariyā Yahyā B. Sharaf-al-Nawawī (d. A.H. 676 = A.D. 1278). For details see H. Kh., Vol. III, p. 518, and Cairo Lib. Cat., Vol. I, p. 345. For other copies *vide* Brock., Vol. I, p. 397.

The MS. has been compared with the author's copy. Written in elegant Naskh by 'A. Karīm B. Md. Dated 719 A.H. Very good copy. (Lith. Lahore, 1876. See Cat. Ar. Books Br. Mus., Vol. II, p. 786.)

(Maḥbūb Yār Jang Lib., Sayfābād Road, Hyderabad.)

22.

الفوائد الطوسية

A work on Shī'ah traditions, by Md. B. Ḥa. B. 'Alī al-Ḥurr al-Āmīlī (d. A.H. 1099 = A.D. 1688). For author see Brock., Vol. II, p. 412, and for his printed works see Br. Mus. Cat. of Ar. Books, Vol. II, p. 182. The author says in the preface:—

هذه فوائد في حل بعض الاحاديث المشككة وفوائد في تحقيق بعض المسائل المعضلة التي كان يسألني في طوس عنها بعض اهل العلم والكمال فاكتب لهم في شرحها ما يقتضيه الحال و يخطر بالبال.

For details see *Shuḥūr al-'Iqyān*, fol. 83 (MS. copy Buhār Coll. Imp. Lib.). Written in the author's time. Dated 1075 A.H.

(Wājīd Ḥu., Yaḥyāganj, Lucknow.)

23.

المصنف في الحديث

A work on traditions, arranged on the system of Fiqh.

Author:—'Abd-Allāh B. Abī Shaybah (d. A.H. 235 = A.D. 849). See *Fihrist*, p. 229, Brock., Vol. I, p. 516. H. Kh. holds a very high opinion of the work and remarks in Vol. V, p. 588:—

وهو كتاب كبير جدا جمع فيه فقارى التابعين واقوال الصحابة واحاديث الرسول صلى الله عليه وسلم على طريقة المحدثين بالاسانيد مرتبا على الكتب والابواب على ترتيب الفقه الخ.

For other copies see Cairo Lib. Ar. Cat., Vol. I, p. 424. 1st Vol. of the work exists in the Nizām Lib., Hyderabad.

2nd Vol. of the work wrongly styled مسند ابى بكر exis

A.S.B. Lib. See Ar. Cat., p. 11. Written in Naskh. (C. 1000 A.H.)

(M. 'A. Ḥayy Lib., Firangī Maḥall, Lucknow.)

24.

النخبة النصرة في احاديث العشرة

A work dealing with the excellences and virtues of the ten companions of the Prophet without author's name, written in Naskh, by Ḥāfiẓ Abu'l-Ḥajar Md. B. Yūsuf. Dated 700 A.H. Some folios are wanting at the beginning.

Beg:— ولابد قيل الشروع في هذا المتنقي من ذكر فصل
في فضل سيدنا *

(Nizām Lib., Hyderabad.)

V.

THEOLOGY.

25.

التقريب والارشاد (الجزء الاول)

First volume of *التقريب والارشاد* on Theology by Ḥāfiẓ Md. B. Muzaffar B. Hibat-Allāh.

The author states at the end that he finished the work on the 10th Ramaḍān A.H. 548 = A.D. 1153, and says as follows:—

بخط يد العبد الفقير الى رحمة الله الغني محمد بن مظفر بن هبة الله
بن سرايا القهسي فرغ من كتابته في العشر الاول من شهر
رمضان من سنة ثمان واربعين وخمس مائة من الهجرة النبوية *

Written in old Naskh. Fol. I is written in a different hand.

Beg:— الحمد لله باب - القول في حد العلم و حقيقته

(Nizām Lib., Hyderabad.)

26.

خالقاهي على شرح عضدية

A super-commentary upon the theological treatise entitled *شرح عضدية* *Sharḥ 'Aḍḍīyah* of Jalāl al-Dīn Dawwānī (d. A.H. 908 = A.D. 1501): see Brock, Vol. II, p. 217. Sprenger Cat., p. 73, *Rawḍāt al-Jannāt*, p. 142.

Author—Yūsuf B. Md. Jān, Qarābāghī Md. Shāhī.

The words *قم* equal to A.H. 1145 indicate the date of composition. Neither the book nor the author is mentioned

in Brock. Edited, with marginal notes, by Md. Rāqim. Lith. Lucknow, 1875. See Cat. Ar. Books in the Br. Mus., Vol. II, p. 814.

Written in good Naskh.

(Chanchal gūrā, Hyderabad.)

27.

درياق الافامي في الرد على الخارج البقاعي

A controversial treatise on theology.

The author wrote this work to prove the prophetic mission of the Prophet in reply to Biqā'ī بقاعى who did not believe in it. Probably this is the same Biqā'ī who died in A.H. 885 = A.D. 1480. See Brock., Vol. II, p. 142, Berl. No. 9694. Composed in A.H. 874.

The name of the author is not given in the work itself, but on the fly-leaf he is called:—

محمد بن جمعة الحمصكي الشيباني

Written in elegant Naskh. (C. 900 A.H.).

Beg:— أو من كان ميتا فأحييناه و جعلنا له الخ ...

(Nizām Lib., Hyderabad.)

28.

رسالة في الروية

A work on theology.

Author:—Abū Bakr Ahmad B. al-Ḥu. B. 'Alī al-Bayhaqī (d. A.H. 458 = A.D. 1066). For author's life see Brock., Vol. I, p. 363. Written in good Nasta'liq by Mīr Muḥammad Yūsuf Bilgrāmī. Dated 1130 A.H. Mīr Md. Yūsuf died in A.H. 1172 = A.D. 1758. See for his life *Sarv-i-Azād*, foll. 117^b—116^b, Author Cat. of the Hyderabad Coll. of MSS., in the A.S.B., p. 4, and *Subḥat al-Marjān*, p. 100.

(M. 'Alī Ḥu. Lib., Kūchah-i-Madrasah-i-A'izzah, Hyderabad.)

29.

الرضية الحسنه في شرح الفريضة المهدوية

An autograph copy of the Commentary by Murād B. 'Alī Khān Tafrīshī, upon his own treatise on Shī'ah theology, entitled *al-Farīdat al-Mahdaviyah* الفريضة المهدوية

Written in Nasta'liq, dated 1093 A.H.

Beg:— اللهم مالك الملك ——— فهذه فوائد الخ

(M. 'Alī Ḥu. Lib., Hyderabad.)

30.

عقائد الخواص

A work on theology, by Muhibb-Allāh Ilāhbādī (d. A.H. 1058 = A.D. 1648). It is divided into several sections, called *Daqā'iq* (دقائق). For author see *Tazkirah-i-'Ulamā'-i-Hind*, by Rahmān 'Alī, p. 175, and *Hadā'iq al-Hanafīyah* of Faqīr Md., p. 412. Written in Naskh.

Scribe:—Fayḍ-Allāh. (c. 1200 A.H.).

Beg:— الحمد لله الدقية الاولى في اثبات الواجب الخ

(M. 'A. Bārī Lib., Firangī Maḥall, Lucknow.)

31.

لميلة المعروف باعتقادية

A work on Shī'ah theology, by Md. Bāqir B. Md. Taqī al-Majlisī (d. A.H. 1110 = A.D. 1698). For author see *Shuḥūr al-'Iqyān*, fol. 53 (MS copy Buhār Collection, Imperial Library). The author composed this work in one night. The greater part of the MS. is in the author's own handwriting. Written in good Naskh. (C. 1200 A.H.).

(M. 'Alī Ḥu. Lib., Kūchah-i-Madrasah-i-A'izzah, Hyderabad.)

32.

مقالات الاسلاميين و اختلاف المضلين (الجزء الاول)

A Commentary by Abu'l-Ha. B. Ismā'il al-Ash'arī (died at Baghdād in A.H. 324 = A.D. 935) on *Ikhtilāf al-Mukhtalifīn*, a work on theology. Written in Naskh. Only the first part of the work exists in the Lib.

Beg:— الحمد لله ذي العزة و الافعال و الجود و الفوال - احمده

على ما خفى الخ *

(Nizām Lib., Hyderabad.)

33.

الموازين الدينية المبينة لعقائد الفرق العلمية

A work on theology, by 'A. Wahhāb B. Aḥmad B. Ālī al-Sha'rānī al-Anṣārī al-Shāfi'ī (d. A.H. 973 = A.D. 1565). It is divided into some Faṣls and a Khātimah. The MS. has been collated with the author's copy. For another copy consult Brock., Vol. II, p. 335. Written in elegant Nasta'liq. (C. 1200 A.H.).

Beg:—

الحمد لله - فهذه عقيدة شريفة ... الخ

(M. 'A. Bārī Lib., Firangī Maḥall, Lucknow.)

34.

نور الانوار في شرح المنار

The well-known commentary upon *al-Manār*, a work on scholastic theology by Abu'l Barakāt 'Abd-Allāh B. Aḥmad al-Nasafī (d. A.H. 710 = A.D. 1310): see Brock., Vol. II, p. 196, and Cat. of Ar. Books in the Br. Mus., Vol. I, p. 148.

Commentator:—Shaykh Aḥmad B. Abī Sa'id known as Mullā Jīwan of Amīthī, a village in the jurisdiction of Lucknow, died at Delhi A.H. 1130 = A.D. 1718. The author compiled this work at Madīnah in the year 1105 A.H.

Autograph copy. Written in bad Naskh. Dated 1105 A.H. For Commentator's life see *Subḥat al-Marjān* of Āzād Bilgrāmī, p. 79. *Hadā'iq al-Hanafīyah* of Faqīr Md., p. 436, and *Tazki rah-i-'Ulamā-i-Hind* (by Rahmān 'Alī), p. 45.

(Nizām Lib., Hyderabad.)

35.

نهاية المرام

A work on theology by 'Umar B. al-Hu. B. al-Ha. al-Ṭab-ārī al-Makkī.

Copyist:—Maḥmūd B. 'A. Salām B. 'A. Raḥīm al-Kirmānī. Dated A.H. 550 = A.D. 1155 as mentioned at the end:—

فرغ من كتابته محمود بن عبد السلم بن عبد الرحيم الكرماني المقيم
بالري - في الخامس من شهر الله المبارك رمضان سنة خمسين و خمماية .

Written in old and neat Naskh.

Beg:—

القول في خلق الاعمال - اعلم ان الترتيب يستدعي

(Nizām Lib., Hyderabad.)

VI.

JURISPRUDENCE.

36.

اختلافات الأئمة الأربعة

A work on jurisprudence by Ahmad B. Sayyid Ishāq B. Sayyid Ibrāhīm al-Ḥasanī al-Ḥusaynī, known as Nizām al-Dīn al-Muhaddith.

Written in Nasta'liq. (c. 1200 A.H.).

(Shams al-'Ulamā', Qāḍī 'Ubayd-Allāh Lib., Madras.)

37.

الازهار في فقه الأئمة الاطهار

A work on Zaydī Law, by al-Mahdī li Dīn-Allāh Ahmad B. Yahyā B. al-Murtadā (d. A.H. 840 = A.D. 1437). For other copies *vide* Brock., Vol. II, p. 187, and for details see Br. Mus. Suppl. No. 365-7. Noticed also by H. Kh., Vol. I, p. 262. The present copy is very valuable. It contains signatures of most of the Imāms of Zaydī sect who must have perused it. Written in Naskh. (c. 900 A.H.).

Beg:—

مقدمة لا يسع المقلد جهلها الخ

(M. 'A. Bārī Lib., Firangī Maḥall, Lucknow.)

38.

توقيف الحكم على غوامض الاحكام

A dissertation on the Laws of Muhammadan marriage, by Ahmad B. 'Imād al-Dīn B. Md. al-Aqfaḥsī al-Miṣrī al-Shāfi'ī (d. A.H. 808 = A.D. 1405) (see Brock., Vol. II, p. 93). It is divided into a few chapters. Noticed by H. Kh. See Vol. II, p. 466. The work is not mentioned in Brock. Written in Naskh. (c. 900 A.H.). Slightly imperfect at the end.

Beg:—الحمد لله الذي خلق من الماء بشرا فجعله نسبا وصهرا الخ

(M. 'A. Bārī Lib., Firangī Maḥall, Lucknow.)

39.

حاشية شرح الوقاية

Short notes upon the well-known Ḥanafī Jurisprudence *Sharḥ al-Wiqāyah* شرح الوقاية of 'Ubayd-Allāh B. Mas'ūd B. Maḥ-

mūd B. Ṣadr al-Sharī'ah (d. A.H. 747 = A.D. 1346) (see Brock., Vol. II, p. 214), by Qāḍī Nūr-Allāh Shūstārī Shī'ī (d. A.H. 1019 = A.D. 1610). For author's life see *Shuṣṣūr al-'Iqyān*, fol. 251^b, MS. copy Buhār Coll., Imp. Lib.

Autograph copy. Written in Naskh.

نحمدك يا من موجز من هدايتك وقاية ... وبعد فيقول:—
العبد الضعيف الذي يرده المشتري الخ *

(M. 'Alī Ḥu. Lib., Kūchah-i-Madrasah-i-A'izzah, Hyderabad.)

40.

الروضة البهية في شرح اللمعة الدمشقية

A Commentary by Zayn al-Dīn B. 'Alī B. Aḥmad al-Shāmī al-Āmīlī (d. A.H. 966 = A.D. 1558) upon a treatise of the Shī'ah law, by Md. B. Makki al-Āmīlī al-Shahīd (d. A.H. 786 = A.D. 1386), entitled *al-Lum'at al-Dimashqīyah fī Fiqh al-Imāmīyah*. See Brock., Vol. II, p. 108. For Commentator's life and his numerous works see *Naqd al-Rijāl*, *Amal al-Āmil*, p. 14, *Qīṣaṣ al-'Ulama'*, p. 197, *Muntaha'l Maqāl*, p. 141. For another copy see Br. Mus. Suppl. Ar. Cat., p. 334. (Lith. on the margin of *al-Sharḥ Raḍavī* (1870): see Cat. of Ar. Books Br. Mus., Vol. II, p. 359.)

Autograph copy. Written in Naskh. Dated A.H. 957.

(M. 'Alī Ḥu. Lib., Kūchah-i-Madrasah-i-A'izzah, Hyderabad.)

41.

رسالة في الاسلام والايمان

A very short treatise on Jurisprudence.

Author:—Aḥmad B. 'A. Ḥalīm, better known as Ibn Taymīyah (d. A.H. 728 = A.D. 1328). See Brock., Vol. II, p. 104, where the MS. is designated as *الکلام علی حقیقة الاسلام والايمان*. See Berl. Lib. Ar. Cat. No. 2089. Written in good Nasta'liq by Mīr Mīd. Yūsuf (d. A.H. 1162 = A.D. 1748) who was a distinguished Mawlavī of Bilgrām. See No. 28 of the Notes for further particulars of scribe.

(M. 'Alī Ḥu. Lib., Kūchah-i-Madrasah-i-A'izzah, Hyderabad.)

42.

رسالة في الحكومة

A valuable treatise on Shī'ah Jurisprudence.

Author:—Aḥmad B. 'A. Ridā, better known as Muhazzab

al-Dīn (d. A.H. 1084 = A.D. 1673). For author see Brock., Vol. II, p. 412.

Autograph copy. Dated A.H. 1084. Written in elegant Naskh. 'Unwān illuminated with gold.

Beg :—

احمدك يا احكم الحاكمين * الخ

(M. 'Alī Ḥu. Lib., Kūchah-i-Madrasah-i-A'izzah, Hyderabad.)

43.

شرح الارشاد

An autograph commentary upon the well-known Shāfi'ī Jurisprudence الارشاد of Ismā'il B. Abi Bakr B. Maqarrī al-Yamānī al-Shāfi'ī (d. A.H. 836 = A.D. 1432).

Commentator :—Muhammad B. Abi Sharif al-Maqdasī (d. A.H. 930 = A.D. 1523.) For details see H. Kh., Vol. I, p. 256. Written in Naskh with marginal notes. Dated 900 A.H. This is only the first part of the work (تم السفر الاول)

(Nizām Lib., Hyderabad.)

44.

شرح منهاج الوصول الى علم الاصول

An extensive commentary on the Shāfi'ī Jurisprudence شرح منهاج الوصول الى علم الاصول of 'Abd-Allāh 'Umar B. al-Bayḍāwī (d. A.H. 685 = A.D. 1286). For details see H. Kh., Vol. VI, p. 214, Brock. vol. I, p. 416.

Commentator :—Aḥmad B. Ḥu. B. Raslān (d. A.H. 844 = A.D. 1440): see Brock., Vol. I, p. 418. For other copies see Berl. 4383, Paris 800. The MS. has been compared with the author's copy. Written in Naskh. Dated 965 A.H. Only the first part of the work exists in this Lib.

(Nizām Lib., Hyderabad.)

45.

خاتمة المأمول في شرح زبدة الاصول

An extensive commentary upon the principles of Shī'ah Jurisprudence.

Commentator :—Jawād al-Kāzīmī. Composed in A.H. 1027. The Commentator and the Commentary are not mentioned in Brock.

Written in good Ta'liq. (c. 1200 A.H.).

(M. 'Alī Ḥu. Lib., Kūchah-i-Madrasah-i-A'izzah, Hyderabad.)

46.

فتاوى ابراهيم شاهي

A collection of opinions and decisions of particular law cases, by Aḥmad B. Md., known as Nizām al-Jilānī, dedicated to Ibrāhīm 'Adil Shāh, King of Bijāpūr, reigned A.H. 941-963 = A.D. 1534-1555. See for details Br. Mus. Pers. Cat., p. 464b, and *al-Nadwah* of 1910, No. 8, pp. 25-28.

The work is unknown to Brock.

For another incomplete copy see Ar. and Per. MSS. Cat., Calcutta Madrasah Lib., p. 19. Three other copies exist in India, one in the Nizām Lib., Hyderabad, and two in the Rampore Lib. Vide Govt. Coll. 1st list A.S.B., p. 1, No. 2, where a MS. is wrongly styled *Fatāwā Ibrāhīm Shāhī*, but it is a different work altogether. The present MS. is defective at the end.

Ends with باب الصيد

Written in elegant Nasta'liq, gold ruled border (C. 1100 A.H.).

(M. 'A. Hayy Lib., Firangī Mahall, Lucknow.)

47.

شرح قرة العين

A glossary by Md. B. Shaykh Yūsuf al-Talāwī upon the *Qurraṭ al-'Ayn*, or Manual of the principles of Jurisprudence, according to the Shāfi'ī school, by Muḥammad B. Muḥammad al-Khattāb al-Mālikī. The قرة العين is a commentary upon the وقفات of Imām al-Ḥaramayn 'A. Mālik B. 'Abd-Allāh al-Juwaynī (d. A.H. 478 = A.D. 1085). See Ibn-Khallikān, Vol. II, p. 120; H. Kh., Vol. VI, p. 433; and Brock., Vol. I, p. 389.

Autograph copy. Written in Naskh.

(Nizām Lib., Hyderabad.)

48.

كشف المرام عن فضائل الصيام

A work on the advantages of fasting in the month of Ramaḍān. It is divided into three chapters: (1) فضائل مطلق في فوائده تتعلق بفضل الصائمين (3), في فضائل شهر رمضان (2), الصوم

Author:—Md. Amīn B. Sayyid Ḥa. Mīr Ghānī. Composed in A.H. 1144 = A.D. 1731. The copy was written by the author's son 'Umar (عمر) in the year 1169 A.H.:—وكان الفراغ من نساخته (نسخه).

سنة ١١٦٩ تسع وستين ومائة و الف على يد الفقير الى ربه الغني عمر
بن المرحوم السيد محمد امين مير غني الحسيني الحنفى *

Written in clear Naskh.

Beg:— الحمد لله الذي فضل شهر رمضان على سائر الشهور - الخ

(M. 'A Bārī Lib., Firangī Mahall, Lucknow.)

49.

مختار الاختيار على المذهب المختار

A work on Jurisprudence.

Author:—Ikhtiyār B. Tālib al-Dīn al-Hasanī. (?)

Written in Nasta'liq. Not dated. The work and the author are not mentioned in the Brock.

Beg:— حمداً لكتاب (a) كريم الخ -

(Shams al-'Ulamā' Qādī 'Ubayd-Allāh Lib., Madras.)

50.

مختصر من علم الامام الغفيس (الغفيس)

A compendium of the legal teachings of the Shāfi'i religion.

Author:—Abū Ibrāhīm Ismā'il B. Yahyā al-Muzanī al-Misrī, who died in Egypt A.H. 264 = A.D. 877. See *Ibn Khalkān*, De Slane's translation, Vol. I, p. 200; *Fihrist*, p. 212; H. Kh., Vol. V, p. 459; and Brock., Vol. I, p. 180. Copies of the *Mukhtasar* are noticed by Pertsch, Gotha Cat. No. 938., Cairo, Lib. Ar. Cat., Vol. III, p. 273, Berl. Lib. Ar. Cat. No. 442. See Br. Mus. Suppl. Lib. Ar. Cat. No. 304.

Written in elegant Naskh. Dated 666 A.H.

(Nizām Lib., Hyderabad.)

51.

مختلف الشيعة

A work on Muhammadan Law, according to the Shī'ah doctrine, by Yūsuf B. 'Alī B. Muṭahhar al-Hillī (d. A.H. 726 = A.D. 1326). (See Brock., Vol. II, p. 164, and J.R.A.S., 1905, p. 516, No. 33.) The present MS. was copied from a copy transcribed from an autograph copy. See for details *Shuṣṣūr al-'Iqyān*, fol. 269-B. (MS copy Buhār Coll. Imp. Lib.).

Written in Naskh. (C. 800 A.H.).

(M. 'A. Bārī Lib., Firangī Mahall, Lucknow.)

52.

مشرق الشمسین

A work on Muhammadan Law according to the Shī'ah doctrine, by Bahā' al-Dīn Md. B. Hu. al-Āmilī (d. A.H. 1031 = A.D. 1621). For author see Brock., Vol. II, p. 414, and Berl. Lib. Ar. Cat. No. 1527.

Written in Naskh. Dated 1084 A.H., as appears from the colophon:—

وقد وقع القواغ من كتابة يوم الجمعة سلخ شهر ذي الحجة سنة ١٠٨٤ هجري

(Wājid Hu. Lib., Maḥallah, Yahyāganj, Lucknow.)

53.

نظامية في فقه الامامية

A work on Shī'ah Jurisprudence.

Author:—Md. B. Ṣāliḥ al-Asadī. Composed in A.H. 986 = A.D. 1578. Written in elegant Naskh. Dated 986 A.H. Autograph copy. See J.R.A.S., 1905, p. 516, No. 36, where a similar MS. is mentioned.

Beg:—

الحمد ... تفرد بالقدم والدوام الخ

(M. 'Alī Hu. Lib., Kūchahi-i-Madrasah-i-A'izzah, Hyderabad.)

54.

وسيلة الراغبين

A work on the Laws of Inheritance according to the Hanbali School, completed in the year A.H. 989 = A.D. 1581.

Author:—Md. B. 'Alī B. Salūm. (The work and the author are not mentioned in Brock.).

Written in Naskh. (c. 1100 A.H.).

Beg:—

الحمد لله بارئ النسمات ومجزل العطايات

(M. 'A Bārī Lib., Firangī Maḥall, Lucknow.)

55.

وسيلة النجاة في احكام الموات

A treatise on Muhammadan obsequies.

Author:—Ibrāhīm B. Ismā'il of Jūnāgarh. (?) The work and the author are not mentioned in Brock. One copy exists in the Rampore Lib.

Written in Naskh. Dated 1235 A.H.

Beg:— الحمد لله الذي قدر امر القوت بجميع مخلوقاته الخ

(Shams al-'Ulamā' Qāḍī 'Ubayd-Allāh Lib., Madras.)

56.

هداية الامة الى احكام الائمة

A work on Shī'ah Jurisprudence by Md. B. Ha. B. 'Alī B. Md. al-Hurra'l-'Āmili (d. A.H. 1099 = A.D. 1688). For author see Brock., Vol. II, p. 412.

The MS. contains only كتاب الصلوة and كتاب الطهارة.

Written in Naskh in Mashhad by Hu. Bahā, al-Dīn B. Muḥammad Qāsim al-Jibrānī al-'Āmili. Dated 1113 A.H.

(Maḥbūb Yār Jang Lib., Sayfābād Road, Hyderabad.)

VII.

SŪFISM.

57.

تنبيه ذوى الهم على معاني الفاظ الحكم

A commentary on the *Hikam-al-'Atā'iyah*, a work on Sūfism, of Aḥmad B. 'Atā-Allāh al-Iskandrānī (d. A.H. 709 = A.D. 1309).

Commentator:—Aḥmad B. 'Isā al-Burnūsī, known as al-Zawraq al-Fāsi.

Autograph copy. Written in Naskh. Dated 1159 A.H.

Beg:— الحمد لله وحده ... اللهم صل على ... كتاب تنبيه ذوى

(Nizām Lib., Hyderabad.)

58.

خوان الفقراء

An abridgment of the *Kashkūl* كشكول of Khwājah Kalim-Allāh al-Chishtī al-Qādirī who was in A.H. 1093 at Madīnah. See *Tarjumah-i-Nawāqid al-Rawāfiḍ*, a MS. of which exists in the A.S.B. Lib. See Pers. Cat. No. $\frac{A}{D}$ 8.

The name of the author is not found in the MS. (Not mentioned in Brock.)

Written in Naskh. Not dated.

Beg:—

الحمد لله ...

(Nizām Lib., Hyderabad.)

59.

عین العلم

A work on Sūfi-ism.

Mullā 'Alī al-Qārī (d. A.H. 1040 = A.D. 1630) wrote a commentary on this text in which, agreeing with Ibn Hajar, he said that the author was an Indian, but according to H. Kh. and others it is by Md. B. 'Uthmān B. 'Umar al-Balkhī (d. A.H. 800 = A.D. 1397). (محمد بن عمر بن عثمان البلخي) See H. Kh., Vol. IV, p. 283.

In the Berl. Lib. Ar. Cat. the title of the work is given as *Manāḥij al-Ārifin* (see No. 3064), and the author is said to be عبد الله بن عبد الرحمن المدائني 'Abd-Allāh B. 'A. Rahmān al-Madā'inī. See also H. Kh., Vol. VI, p. 159.

The work is divided into 20 chapters and a Khātimah. Written in elegant Nasta'liq on blue paper. (Not mentioned in Brock.) Many copies exist in India. Dr. Ross and E. G. Browne also mention a copy in their Catalogue (see p. 160) and Ind. Off. Lib. Cat., p. 190, where it is mentioned that it is not an abridgment of Ghazzālī's *Ihyā'* as stated by Stewart in his Cat., p. 139. The work has been lithographed with meanings in Persian at (Pishāwar) in 1281 A.H.

(Nizām Lib., Hyderabad.)

60.

کنز الهدایات فی معرفة البدایات والنہایات

A work on Sūfi-ism.

Author:—Md. Bāqir B. Ja'far of Delhi. (?) (Not mentioned in Brock.)

Written in Naskh. Dated 1187 A.H.

Beg:—نحمدک یا من تفرد بالقیومية والبقاء

(Shams al-'Ulamā' Qāḍī 'Ubayd-Allāh Lib., Madras.)

61.

کیمیاء الیقین

A work on Sūfi-ism, by Aḥmad B. Idrīs (d. A.H. 684 = A.D. 1285). Probably he is Shihāb al-Dīn Aḥmad B. Idrīs al-Qarāfi al-Mālikī, commentator of the *Tanqīh al-Fusūl* of Fakhr al-Dīn al-Rāzī (d. A.H. 606 = A.D. 1209). (For author and his other works see Brock., Vol. I, p. 506).

Written in cursive Naskh. (C. 1200 A.H.)

Beg:—الحمد لله الذي جعل قلوب اوليائه الخ

(M. 'A Bārī Lib., Firangī Mahall, Lucknow.)

62.

المحركات الرافعات

A work on Šūfī-ism, by Mustafā B. Kamāl al-Dīn B. ‘Alī al-Šiddīqī (d. A.H. 1162 = A.D. 1749).

It is an abridgment of the author's three previous works كروم عروض التهاني - فيض القدوس - الروضات العرشية Berl. Lib. Ar. Cat., No. 3913. For author and his other works see Brock., Vol. II, p. 308.

Written in good Naskh. Dated 1223 A.H.

Beg:— الحمد ... فيقول الفقير ... مصطفى بن كمال ...
 ايقظني الحق ليلة الثلاثاء (الثلاثاء)

(M. ‘A. Bāri Lib., Firangī Maḥall, Lucknow.)

63.

البلد الامين والدرع الحصين

A work on prayers according to the Shī‘ah tradition, by Ibrāhīm B. ‘Alī B. Ḥa. B. Md. B. Sāliḥ al-‘Āmilī al-Kaf‘amī, who composed his other works in 895 A.H. See for author's life *Amal al-Āmil*, p. 5. In the Buhār Coll. Imp. Lib. another copy exists, but the beginnings are different.

Written in elegant Naskh within gold-ruled borders with marginal notes in Shikastah. Dated 1080 A.H. First folio is illuminated. The MS. contains two other treatises, viz., مختصر من شرح ابى الفتوح and محاسبة النفس للوامة by Shihāb al-Dīn al-Suhrawardī on Šūfī-ism.

Beg:— الحمد لله الذي جعل الدعاء الخ

(Wājid Ḥu., Maḥallah Yahyāganj, Lucknow.)

64.

مصباح المتعجبين

An extensive work on Shī‘ah prayer, by Aḥmad B. Rukn-al-Dīn al-Ḥusaynī al-Raḍawī. It is divided into a مقدمة and three اجزاء.

Written in elegant Naskh. (C. 1200 A.H.) Good copy.

Beg:— الحمد لله على جزيل نواله وجميل افضاله الخ

(Jugail Kishore, Lucknow Chawk.)

VIII.

BIOGRAPHY.

65.

كتاب اخبار النكويين

A short biographical dictionary of the eminent grammarians of the sixth century of the Hijrah in alphabetical order with specimens of their works.

Author:—Abu'l Ha. 'Alī B. Yūsuf B. Ibrāhīm al-Shaybānī al-Qifṭī Jamāl al-Dīn (d. A.H. 646=A.D. 1248). For a detailed account of the author, consult *Mu'jam al-Bulḍān* of Yāqūt Ḥamavī, Vol. IV, p. 152, and *Iktisā' al-Qunū'*, p. 57.

From a note on a fly-leaf at the beginning it appears that from fol. 2—95 have been written by the author himself. Written in old Naskh. (C. 700 A.H.) For another copy see Brock., Vol. I, p. 325.

The title of the work given in H. Kh., Vol. I, p. 441, is *Inbā' al-Ruwāt 'alā Abnā' al-Nuḥāt* (إنباء الرواة على أبناء النحاة)

Beg:—محمد بن احمد الرقي من ولد عبد الله بن قيس الخ

(Nizām Lib., Hyderabad.)

66.

البحر الزاخر في علم الاوائل والاواخر

An abridgment of the history entitled *المضية في* *اليواقيت* of 'Alī B. Yahyā B. Yūnus B. Khallikān, by Maḥmūd B. Qāsim B. Ṣā'in al-Dīn al-Anṣārī.

The original work was dedicated to al-Wāṭhiq bi'llāh (d. A.H. 232=A.D. 847), the ninth Caliph of the Abbāsīd dynasty.

The work deals for the greater part with fictitious tales and anecdotes. The work is not mentioned in Brock.

Written in Naskh. Dated 1160 A.H.

Beg:—الحمد لله العزيز العالم القيوم فاطر السموات والارض

(Nizām Lib., Hyderabad.)

67.

قزئين الممالك بمناقب الامام مالك

A work on the merits and glories of the Imām Mālik.

Author:—'A. Raḥmān B. Abī Bakr. Jalāl al-Dīn al-Suyūṭī (d. A.H. 911=A.D. 1505). See H. Kh., Vol. II, p. 286.

Written in Naskh. Dated 1285 A.H.

(Shams al-'Ulamā' Qāḍī 'Ubayd-Allāh Lib., Madras.)

68.

تلخيص المستقصى في تاريخ المسجد الاقصى

A work containing a description of the Temple of Jerusalem without author's name. This is most probably an abridgment of ابن عساكر دمشقى by الجامع المستقصى في تاريخ المسجد الاقصى (d. A.H. 600 = A.D. 1203). See for Ibn-'Asākir Brock., Vol. II, p. 130, Br. Mus. Suppl. Ar. Cat. No. 1250. Written in Naskh. (C. 900 A.H.).

(Nāsir Hū. Lib., Khajwah, Lucknow.)

69.

الحدايق

Lives of the Imāms of the Zaydiyyah Sect.

Author:—'Abd-Allāh B. Md. B. al-Sīd al-Bataljūsī (d. A.H. 521 = A.D. 1127). Brock. (Vol. I, p. 427) mentions that one copy only is in Berl. Lib.) written in Naskh (C. 1000 A.H.).

(Nāsir Hū. Lib., Khajwah, Lucknow.)

70.

ذوب الذهب

A work containing biographical notices of the Arabian poets of Yemen, without author's name.

Composed in A.H. 1207. Not mentioned in Brock. Written in Naskh.

(Nizām Lib., Hyderabad.)

71.

رسالة كن فيكون

A treatise on the life-work of Imām Abū Hanifah by Ismā'il Shāh of Rampore. The author presented this work to Sultān 'A. Majīd Khān B. Mahmūd Khān, the Turkish Emperor of Constantinople, who died in A.H. 1278 = A.D. 1861. Written in ordinary Naskh. Dated 1275 A.H.

(Wājīd Hū., Yahyāganj, Lucknow.)

72.

روضة الافكار والافهام لمرتان حال الامام

Life of Md. B. 'A. Wahhāb Najdī, the founder of the Wahhābī Sect, who died in A.H. 1206 = A.D. 1791. See Br. Mus.

Arabic Catalogue, pp. 436a., 784a. It is divided into one chapter and five *faṣls*. Written in Naskh by Aḥmad Abu'l Khayr al-Makkī. Dated 1200 A.H.

(Nizām Lib., Hyderabad.)

73.

زهر الرياض و زلال الكياض

This treatise deals with the lives of the first four Caliphs of the Prophet, by Sayyid Ḥa. B. 'Alī B. Shadqam al-Ḥasanī-al-Madani سید حسن بن علی بن شذقم الحسني المدني. The author flourished in the time of Nizām 'Alī Khān of Hyderabad (A.H. 1175-1218 = A.D. 1761-1803). Vide for author *Amal al-Āmil*, p. 38, and for the Nizām see O. B. D. of Mr. Beale, p. 300, and Br. Mus. Pers. Cat., pp. 325, 326 and 723. Written in Naskh. (C 1200 A.H.)

(Nāṣir Ḥu. Lib., Khajwah, Lucknow.)

74.

العمدة

The work deals with the virtues and excellences of the Imāms by Yahyā B. Ḥa. B. al-Ḥu. B. 'Alī al-Asadī al-Ḥillī al-Rib'ī, known as Ibn-Batriq (ابن بطريق) (d. A.H. 600 = A.D. 1203). For author see *Amal al-Āmil*, p. 73, *Rawḍāt al-Jannāt*, p. 232, and *Shuzūr al-'Iqyān*, fol. 258^a. (MS. copy Buhār Collection, Imp. Library). One copy of the work under notice is in the Buhār Collection, Imperial Library. Written in ordinary Ta'liq. Not dated.

Beg:—حدث الشيخ الاجل الاوحد... الحمد لله شكرًا لجزيل آلائه..

(Nāṣir Ḥu. Lib., Khajwah, Lucknow.)

75.

الفخر المنير

A work dealing with the lives of those companions who assisted the Prophet in the battle of Badr (غزوة بدر)

Author:—Md. B. Md. B. al-Ḥu. al-Sandūsī. (?) Written in Naskh.

(M. 'A. Bērī Lib., Firangī Mahall, Lucknow.)

76.

لوامع انوار التمجيد المنتخب من مشارق انوار اليقين

This work deals with the virtues of the descendants of the Prophet and their superiority over others.

Author:—Rajab B. Md. B. Rajab, known as al-Hāfiẓ al-Bursī (d. c. A.H. 900 = A.D. 1494). For author see *Amal al-Āmil*, p. 44, and *Rawḍāt al-Jannāt*, p. 284. Written in Naskh. (C. 1000 A.H.)

Beg:—

الحمد لله الواحد من قلة الخ

(Nāṣir Ḥu. Lib., Khajwah, Lucknow.)

77.

محاسن اصفهان

A rare topographical work on the beauties of Isfahan, the old capital of Persia, with copious poetical extracts from various authors.

Author:—Al-Mufaḍḍal B. Sa'īd B. al-Ḥu. It is stated at the end that the work was written in the time of Jalāl al-Dīn Md. B. Md. Amīr al-Ṭabāṭabā'i and after the death of Shāh 'Abbās Ṣafavī (who died in A.H. 1038 = A.D. 1629) at Isfahān:—

تمت الرسالة بعد نصف الليل من يوم الأربعاء من شهر سنة ألف وثمان وثلثين
بعهد جلال الدين محمد بن محمد امير الطباطبائي وذلك بعد وفاة السلطان شاه
عباس الصفوي *

Beg:—

ان الله قدست اسماء وعظمت آلائه وجل ثنائاه

Only one incorrect copy without title or author's name is mentioned, the Br. Mus. Suppl. Ar. Cat., see p. 476, No. 703. Written in Shikastah. Dated 1038 A.H. The work has been translated into Persian by Ḥu. B. Md. al-'Alavī, and described by E. G. Browne. See J.R.A.S. 1901. Art. XV, p. 411.

(Nizām Lib., Hyderabad.)

78.

(كتاب) المصطفين والمصطفيات

(1) Lives of some traditionists, Ṣūfis and companions of the Prophet, by Aḥmad Badavī al-Husaynī (d. A.H. 675 = A.D. 1276). For author vide Brock., Vol. I, p. 450.

Copyist:—'Alī B. 'Ubayd-Allāh. Written in good Naskh. Dated 901 A.H.

The MS. has been compared with the author's copy.
Bound up with two different treatises :—

(1) رسالة في آداب الذكر (1)

A tract on Sūfī-ism.

Written in Naskh. Not dated.

(2) مناقب سيدى احمد بدوي

Life of Abu'l 'Abbās Aḥmad B. 'Alī B. Ibrāhīm al-Badavī,
the popular saint of Egypt (d. A.H. 675 = A.D. 1276).

The name of the author is not mentioned in the MS.
Written in Naskh. Dated 863 A.H.

For another copy vide Brock., Vol. I, p. 450.

(Nizām Lib., Hyderabad.)

79.

معدن البواقيت الملتمة في مناقب الائمة الاربعة

A work on the life-works of the first four Caliphs, by an
anonymous author. It is divided into five chapters. Another
copy of the work is in the Lib. of M. 'A. Hayy of Firangī Maḥall,
Lucknow.

Scribe :—Ghiyāḥ al-Dīn. Written in Naskh. Dated Mad-
ras 1234 A.H.

Reg :—الحمد لله الذي جعل علماء هذه الامة الخ

(M. 'A Bārī, Firangī Maḥall, Lucknow.)

80.

المفاخر العلية في المآثر الشاذلية

A work on the life of Sayyid Shams al-Dīn Md. B. Ḥa. B.
Alī al-Hanafī al-Sūfī al-Shāzīlī (d. A.H. 847 = A.D. 1443). See
Brock., Vol. II, p. 121.

Author :—Aḥmad B. 'Abbād.

It is divided into five chapters. Written in Naskh. Printed in
Egypt. Autograph copy. Dated 1124 A.H.

Beg :—الحمد لله الذي من اعظم به نجاه ومن اطاعة بفضلها فافاه

(Nizām Lib., Hyderabad.)

81.

مقاصد التتبع في شرح الصحيح في بيان
اسامي الرواة من الرجال والنساء

A short biographical dictionary of the traditionists of both sexes.

Author:—‘Afif B. Sa‘īd B. Mas‘ūd B. Md. al-Kāzarūnī. For another work of the same author see O. P. Lib. Cat., Vol. VI, No. 484, p. 82. Written in elegant Naskh. Dated 1252 A.H.

Beg:— الحمد لله الذي وفقنا لإقامة الشهادة الخ

(Nizām Lib., Hyderabad.)

82.

(كتاب) المناقب

Another work on the same subject, by Muwaffaq B. Aḥmad al-Makkī al-Bakrī al-Khwārizmī. The MS. was copied by the late M. Ḥāmid Ḥu., the father of Nāṣir Ḥu., from a copy in the Lib. of ‘A. Ḥa. al-Tihirānī (عبد الحسن الطهراني) at Karbalā. Written in Naskh. (C. 1300 A.H.).

Beg:— حدثنا الشيخ العفيف الخ

(Nāṣir Ḥu. Lib., Khajwah, Lucknow.)

83.

مناقب ابن المغازلي

The work deals with the virtues of the descendants of the Prophet and their superiority over others. A few pages at the beginning are wanting. Written in Naskh. (C. 900 A.H.).

(Nāṣir Ḥu. Lib., Khajwah, Lucknow.)

84.

(كتاب) المنق

An extremely valuable work dealing with the history of the early Quraysh, a tribe of Mecca, by Abū Ja‘far Md. B. Ḥabīb al-Ḥāshimī al-Baghdādī (d. A.H. 245 = A.D. 895). For author see Brock., Vol. I, p. 106, and Ḥ. Kh., Vol. I, p. 456. Written in Naskh. (C. 600 A.H.).

Beg :— أخبرنا أبو الحسن محمد بن العباس الحنبلي قال
أخبرنا محمد بن حبيب قال أول ما ذكر من أحاديث قريش ما
خصها الله من الفضل والمن به سائر الخلق وإنه بعث منها نبي الرحمة الخ

(Nāṣir Ḥu. Lib., Khajwah, Lucknow.)

85.

(كتاب) المؤلف والمختلف

A dictionary of such names of traditionists as are liable to be confounded, by Ḥāfiẓ 'A. Ḡhanī B. Sa'id B. 'Alī al-Azdī al-Miṣrī (author of *Muṣṭabih al-Nisbah* المشتبه النسبة) (d. A.H. 409 = A.D. 1018). For details and other copies see Brock., Vol. I, p. 168. Unfortunately, slightly defective at the beginning. Written in Naskh. Very old copy. Dated 564 A.H. Printed in India.

Beg :—

باب اسيد بالضم الخ

(M. 'A. Ḥayy, Firangī Maḥall Lib., Lucknow.)

86.

مواليد اهل بيت

It deals with the names, titles and burial places of the descendants of the Prophet, by 'Alī B. Mūsā Riḍā, who wrote it for طبقات الحفاظ by نصر بن علي الجهضمي (Consult for his life by سيوطي Chapter VIII.) This MS. was copied from a MS. of the Najaf Lib. Written in Naskh. (C. 1200 A.H.)

(Nāṣir Ḥu. Lib., Khajwah, Lucknow.)

87.

نزهة الفكر في تراجم (اعيان) القرن الثاني والثالث عشر (جزء رابع)

The fourth volume of the biographies of the noblemen and eminent 'Ula mā' of the 12th and 13th century of Hijrah.

Author :— Aḥmad B. Md. al-Ḥafrāwī.

Arranged alphabetically. Written in Naskh. Not dated.

Beg :—

احمد على نعمة التي الخ

(Nizām Lib., Hyderabad.)

88.

نوادير الزمان

An autograph copy of a modern historical work, composed in Birūt in A.H. 1286 = A.D. 1869.

Author :—Iskandar Aghā B. Ya'qūb Abkārīūs (d. A.H. 1303 = A.D. 1885). See Brock., Vol. II, p. 495, and Cairo Lib. Ar. Cat. Vol. V, p. 171. The contents of the present compilation are as follow :—

(1) A short history of Mount Lebanon جبل لبنان

(2) A short history of Damascus دمشق.

The work is divided into nine Fāsils.

In a letter, dated A.D. 1887, quoted at the beginning of the work, the author says that he presented it to a gentleman of Hyderabad.

Written in a good Naskh.

Beg :— حمد لمن تفرد بالهبة والكمال والعظمة والجلال الخ

(Nizām Lib., Hyderabad.)

89.

(كتاب) مشتهبه النسبة

A work dealing with those names of traditionists which are alike and similar in forms, e.g. :—

سلم - سلم - سنكي - سبكي

Author :—Hāfīz 'A. Ghānī B. Sa'id B. 'Alī al-Aẓdī (d. A.H. 409 = A.D. 1018).

The author distinguishes the names by giving diacritical and vowel points with a meagre account of each of them. Arranged in alphabetical order. The earlier part from الف to a portion of س is wanting. For details see Br. Mus. Suppl. Ar. Cat. No. 619. For author and his works consult Brock., Vol. I, p. 167.

A copy of the same work exists in the Government of India Coll. in the A.S.B. Written by Ha. Balvī in Naskh. Old copy. Dated 708 A.H. Printed in India.

(Nizām Lib., Hyderabad.)

IX.

PHILOLOGY.

90.

اصلاح المنطق

A very old, valuable and well-known copy of a lexicographical work, by Abū Yūsuf Ya'qūb B. Ishāq B. al-Sikkī, who was one of the most eminent 'Arab lexicographers and was put to death by al-Mutawakkil, A.H. 243 = A.D. 857. For notices of his life see *Ibn Khallikān*, De Slane's Translation IV, 293, *Fihrist*, p. 72, *Kāmil*, Vol. VII, p. 59, and H. Kh., Vol. I, p. 328. The words are arranged under the various normal forms of the language, and exemplified by quotations from ancient poets. For other copies consult Brock., Vol. I, p. 117.

Written in Naskh. Dated 599 A.H.

Beg :— الحمد لله الذي شرف الأنام بما عيّنهم به من الأنعام
باب فَعَلٍ وَفَعَّلٍ وَفَعَّلٍ

(Nizām Lib., Hyderabad.)

91.

الجمهرة

A very valuable and complete copy of the well-known lexicon by the celebrated lexicographer Abū Bakr Muḥammad B. al-Ḥa. B. Durayd, who died A.H. 321 = A.D. 934. See H. Kh., Vol. II, p. 629, and *Fihrist*, p. 61.

For other copies consult Brock., Vol. I, pp. 111-112.

Written in elegant and neat Nasta'liq. Dated 1078.

Copyist :—Md. Sharīf al-Ṭatnī.

(Nizām Lib., Hyderabad.)

92.

الصراح

The well-known and valuable abridgment of Jawharī's famous Arabic Dictionary, the *Siḥāḥ*, by Abu'l Faḍl Muḥammad B. 'Umar B. Khālid, commonly known as Jamāl al-Qurashī (d. A.H. 681 = A.D. 1282), with the Persian equivalents added to the Arabic words. Consult Brock., Vol. I, p. 296.

It was completed on the 16th of Safar A.H. 681 = A.D. 1282. It is probably an autograph copy. Written in good neat Nasta'liq. Dated 681 A.H.

The lexicon is very popular in India and it has been printed several times.

(Nizām Lib., Hyderabad.)

X.

GRAMMAR.

93.

الدرر الالفية

A commentary upon the grammatical work of Abū Zakariyā Yahyā B. 'A. Mu'tī B. 'Abd al-Nūr al-Zawābī, who died A.H. 628 = A.D. 1230.

Commentator:—Md. B. Aḥmad al-Sharīshī (d. A.H. 685 = A.D. 1286). For details see Brock., Vol. I, p. 303.

Written in old Naskh. Dated 785 A.H. One fol. is wanting.

(Nizām Lib., Hyderabad.)

94.

متن متین فی النکو

A useful and autograph copy of an 'Arabic Grammar by 'A. Rasūl B. Md. Ridā al-Ansarī, composed in A.H. 1177 = A.D. 1763, as appears from the following passage:—

اتفق الاتمام ليلة الجمعة الحادية عشر من شوال من سابعة السبعة
الزائدة على سبعين للمائة الثانية للالف الثاني بعون الله الكريم المتعال للعبد
المذنب الراجي الى رحمة ربه الكريم الهادي ابن محمد رضا عبد الرسول
الانصاري الهروي المظفر آبادي - اللهم اجعلني من الراستقين في المحبة
سيد المرسلين و احشرنني مع اهل بيت رسولك الكريم عليه وعلى آله
وصحبه الصلوة والتسليم *

Written in elegant Nasta'liq.

Beg:— الحمد لله على الاختتام وعلى النبي الخ

(M. 'Alī Ḥusayn Lib., Kūchah-i-Madrasah-i-A'izzah, Hyderabad.)

XI.

RHETORIC.

95.

شرح رسالة الحور العين و تنبيه السامعين
في البلاغة

A commentary upon the rhetorical work حور العين of Nash-wān B. Sa'id al-Himyari (d. A.H. 573 = A.D. 1117) by an anonymous author. See Brock., Vol. I, p. 300, Berl. Lib. Ar. Cat. No. 8753-4. The commentary is not mentioned in Brock.

Written in old Naskh. Not dated; old copy.

Beg: — اما بعد الحمد لله الذي استوجب الحمد لكرمه وجوده الخ —

(Nizām Lib., Hyderabad.)

XII.

PROSODY.

96.

كشف الغموض في علم العروض

A treatise on Prosody.

Author:—‘A. Sattār B. ‘Alī B. al-Hu. See H. Kh., Vol. V, p. 211. Autograph copy. Written in Naskh. Dated 919 A.H.

Beg: — الحمد لله الذي جعل العروض ميزان الكلام

(Nizām Lib., Hyderabad.)

97.

شرح قصيدة خزرجية

A commentary upon the metrical treatise of Diyā' al-Dīn Abū Muḥammad ‘Abd-Allāh B. Muḥammad al-Khazrajī, who died in A.H. 626 = A.D. 1228 Consult Brock., Vol. I, p. 312.

Commentator:—Ghulām Naqshband, known as al-Shāfi‘ī, who flourished in the 12th century of the Hijrah. See for another work of the commentator No. 126. Written in ordinary Ta‘liq. Dated 1059 A.H. The commentary is not mentioned in Brock.

Beg: — ان انقل شعراً يوزن بميزان الاذهان الخ

(Wājid Husayn, Yahya Gang, Lucknow.)

XIII.

PROVERBS.

98.

تمثال الاعمال

A work on Arabic proverbs, by Jamāl al-Dīn Muḥammad B. 'Alī B. Muḥammad B. Abū Bakr al-Shaybī al-Makkī al-Shāfi'ī (d. A.H. 837 = A.D. 1433). Composed for Nāsir 'Alī B. Ashraf Ismā'il, the Amīr of Yaman. See for author's life and his works O.P. Lib. Copy of *Murjam* by Ibn-i-Fahd (d. A.H. 885 = A.D. 1409) fol. 241b. (For Fahd see Brock, Vol. II, p. 175). The MS. is dated 845, i.e., 8 years after the author's death.

Scribe:—Muḥammad B. Aḥmad B. Muḥammad B. Sa'id al-Shāfi'ī. Written in Arabian Naskh.

Beg:— الحمد لله المنزه عن المثل وله المثل الاعلى - الخ

(M. Khalil al-Dīn Aḥmad Library, Salimpurah, Benares.)

XIV.

LITERATURE.

99.

حكم عرفانية

A work upon Arabic literature with notes, by 'Abd al-Jalīl Bilgrāmī, who died in A.H. 1138 = A.D. 1725; see Br. Mus. Pers. Cat., p. 963b. The name of the author is not mentioned in the MS.

Written in good Nasta'liq.

(M. 'Alī Ḥusayn Lib., Kūchah-i-Madrasah-i-A'izzah, Hyderabad.)

100.

رسالة مشكلات صعبة

A treatise on Arabic literature.

Author:—Aḥmad B. 'Abd al-Riḍā, better known Muḥaz-zab al-Dīn (d. A.H. 1084 = A.D. 1673); see Brock., Vol. II, p. 412. This is also an autograph copy. Written in elegant Naskh. Dated 1084. Illuminated with gold.

Beg:— وبعد الحمد لمسهل الامور الخ -

(M. 'Alī Ḥusayn Lib., Kūchah-i-Madrasah-i-A'izzah, Hyderabad.)

101.

شفاء العليل في اصلاح كلام المتنبي

A critical treatise on Mutanabbi's (d. A.H. 354 = A.D. 965) works by Mir Ghulām 'Alī Āzād Bilgrāmī (d. A.H. 1200 = A.D. 1785).

The following is a short extract from Bilgrāmī's preface.

ولا يخفى على الطبيب العارف بمعالجة الأمراض ان منصب
الاصلاح اعلى و ارفع من منصب الاعتراض فوق في خاطري ان اصلح ما في
كلامه من الفساد الخ

Written in Ta'liq, not dated.

The MS. bears copious marginal notes in the handwriting of Āzād Bilgrāmī.

(M. 'Alī Husayn Lib., Kūchah-i-Madrasah-i-A'izzah, Hyderabad.)

XV.

ORNATE PROSE AND LETTER.

102.

معارك الكتاب

A work on miscellaneous subjects, by Ḥāfiẓ al-Dīn Muḥammad B. 'Adil Pāshā al-'Ajāmī.

See for details H. *Kh.*, Vol V. p. 610.

The copy was transcribed from the MS. in the Bhupāl library in 1312 A.H.

Scribe:—Muḥammad 'Abd al-Wāsi'.

Beg:—

اليه يصعد الكلم الطيب الخ

(Nadwat al-'Ulamā' Library, Golagang, Lucknow.)

103.

مراعات الغزلان في وصف الغلمان

A work on literature.

Author:—M. B. Ḥasan al-Nawājī al-Qāhirī al-Shāfi'ī (d. A.H. 859 = A.D. 1455). See for other copies Brock., Vol. II, p. 56, and for notice H. *Kh.*, Vol. V, p. 487.

Written in elegant Naskh. Not dated.

(Nizām Lib., Hyderabad.)

XVI.

SCIENCES.

104.

اسرار الآيات وانوار البينات

A work on Philosophy.

Author:—Šadr al-Dīn Muḥammad (Mullā) B. Ibrāhīm Shī-rāzī, called Mullā Šadrā (d. A.H. 1050 = A.D. 1640). For author and his other works see Brock., Vol. II, p. 413, and Berl. Lib. Ar. Cat. No. 306a.

Written in elegant Nasta'liq, by the author's son. Not dated.

Beg:—

نحمدك اللهم يا من بيده ملكوت الارض الخ
(Nizām Lib., Hyderabad.)

105.

تسويلات الفلاسفة

A work on Philosophy, by Abū Sa'īd Zāhūr al-Haqq. (?)
Written in careless Ta'liq (c. 1300 H.).

Beg:—

سبحان الله العزيز الحكيم الخ
(Nadwat al-'Ulamā' Lib., Lucknow.)

106.

المبني

An exceedingly valuable copy of the well-known Commentary upon the philosophical work of Mufaddal B. 'Umar Athīr al-Dīn Abharī's (d. A.H. 663 = A.D. 1264) *Hidāyat al-Hikmat*.

Commentator:—Husayn B. Mu'in al-Dīn al-Maybuzī (d. A.H. 890 = A.D. 1475). See Brock., Vol. I, p. 464, Br. Mus. Cat. Ar. Books, Vol. I, p. 701, and Calcutta Madrasah Lib. Ar. and Pers. MSS. Cat. Written in Naskh. Dated 701 A.H. Autograph copy.

(Nizām Lib., Hyderabad.)

LOGIC.

107.

رسالة في المنطق

A versified treatise on Logic, by Aḥmad B. 'Abd al-Ridā, better known Muhazzab al-Dīn (d. A.H. 1084 = A.D. 1673). For

author and his other works see Brock., Vol. II, p. 412, Br. Mus. Pers. Cat., Vol. II, p. 864^a, and No. 100 and 108 of the notes. Written in good Ta'liq, with an illuminated 'Unwān. Dated 1080 A.H. Autograph copy.

Beg:— و بعد حمد الله والسلام عليه ثم آله الكرام الخ

(M. 'Alī Ḥu. Lib., Kūchah-i-Madrasah-i-A'izzah, Hyderabad.)

XVIII.

ETHICS.

108.

جبة الاحباب

A treatise on Ethics.

Author:—Aḥmad B. 'Abd al-Ridā, better known Muhazzab al-Dīn (d. A.H. 1084=A.D. 1673). For author and his other works see Brock., Vol. II, p. 412; Br. Mus. Pers. Cat., Vol. II, p. 864^a, and No. 100 and 107 of the notes. Written in good Naskh with illuminations. Dated 1079 A.H. Autograph copy.

(M. 'Alī Ḥu. Lib., Kūchah-i-Madrasah-i-A'izzah, Hyderabad.)

XIX.

MATHEMATICS.

109.

شرح خلاصة الحساب

A Commentary upon the well-known arithmetical work *Ḥaṣṣat al-Ḥisāb* of Bahā' al-Dīn Md. B. Ḥu. B. 'Abd al-Ṣamad al-Ḥārithī al-Āmulī (d. A.H. 1030=A.D. 1621). The original work has been Lith. in A.H. 1285 and 1299. See Br. Mus. Cat. Ar. Books, Vol. II, p. 190 and Brock., Vol. II, p. 414.

Commentator:—Shams al-Dīn 'Alī al-Khalkhālī. See Brock., Vol. II, p. 415. Written in excellent Naskh. Dated A.H. 1221.

(M. 'Alī Ḥu. Lib., Kūchah-i-Madrasah-i-A'izzah, Hyderabad.)

XX.

ASTRONOMY.

110.

مرآة العالم

A work on Astronomy.

Author:—Hāfiẓ Ah. B. Shaykh Tilimsānī al-Anṣārī. Written in ordinary Nasta'liq. Dated A.H. 1235.

Beg:— نَعْمَدُكَ يَا مَنْ لَا إِلَهَ إِلَّا أَنْتَ وَنَشْكُوكَ الْخ

(Shams al-'Ulamā' Qādī 'Ubayd-Allāh Lib., Madras.)

111.

زهرة الزاهرة

A treatise on Astrolabe and its use, without author's name. It is divided into a مقدمه (Introduction) and 12 باب (chapters). Written in ordinary Nasta'liq (c. A.H. 1100).

Beg:— وَبَعْدَ فَهَذِهِ رِسَالَةٌ مُفِيدَةٌ فَوَائِدُهَا فَوَائِدُ الْخ

(M. 'A. Hayy. Lib., Firangī Maḥall, Lucknow.)

XXI.

ALCHEMY.

112.

(١) حل الطلسم وكشف السر المبهم

Author:—Abu'l 'Abbās Ah. B. Md. al-Qhamrī (d. A.H. 905 = A.D. 1499). According to Brock., Vol. II, p. 170, only one copy is in the Cairo Lib.: see Ar. Cat., Vol. V, p. 335. Written in ordinary Naskh. Not dated.

Beg:— الْحَمْدُ لِلَّهِ الَّذِي خَلَقَ الْأَرْوَاحَ وَالْأَجْسَادَ الْخ

(Nizām Lib., Hyderabad.)

113.

(٢) السر الرباني في علم الميزان

Author:—'Alī Beg al-Azrūqī al-Rūmī al-Jadīd. See H. Kh., Vol. III, p. 593. For another copy see Berl. Lib. Ar. Cat. No. 4189. The work is not mentioned in Brock. Written in the same hand. Not dated.

Beg:— الْحَمْدُ لِلَّهِ الَّذِي تَقَدَّسَ ذِئْبُهُ عَنْ مَدَارِكِ الْأَوْهَامِ الْخ

(Nizām Lib., Hyderabad.)

114.

(٣) السر المكتون والدر المصون

By an anonymous author.

Written in the same hand. Not dated.

Beg:— سبحان الذي احاطه علمه في الآخرة الخ

(Nizām Lib., Hyderabad.)

115.

مصحات افلاطون

A work on Alchemy, by Abū Mūsā Jābir B. Hayyān (d. c. A.H. 160 = A.D. 776). The work is divided into 90 Tashīh, as appears from the preface of the work.

Only one copy is mentioned in Brock. See Vol. I, p. 241. For author's life see *Ibn Khallikān*, vers. De Slane, Vol. I, p. 300; *Fihrist*, pp. 354-8, and Cat. Ar. Books Br. Mus., Vol. I, p. 771. Written in Naskh in a modern hand.

قال المراكشي هذا كتاب مصحات افلاطون ونفسير جابر بن

حيان - قال هداى الله للتقوى ينبغي ان يفهم - الخ

(Bahādur Shāh, Mochigate, Lahore.)

XXII.

MAGIC.

116.

المختار في كشف الاسرار وهتك الاستار

An interesting work on Magic.

Author:—Abd al-Rahmān B. Abī Bakr al-Dimishqī al-Jawbarī (d. c. A.H. 630 = A.D. 1233). It is an incomparable work as H. Kh. (Vol. V, p. 438) says:—

وهو كتاب غريب ليس له نظير في بابة اخذه مؤلفه على ما قاله في اوله من ينبوع الحكمة والاسفار الخمسة وكتب الاوائل والاواخر من نحو الف وثلاثمائة كتاب فهتك استار الكاذبين وكشف عورات المدعين من كل قوم - الخ

For details see Berl. Lib. Ar. Cat., Vol. V, No. 5563. For other copies see Brock., Vol. I, p. 497. Written in elegant Naskh. Dated 771 A.H.

Beg:— الحمد لله الملك الاعظم مظهر الموجودات بعد العدم الخ

(Nizām Lib., Hyderabad.)

XXIII.

MEDICINE.

117.

الفوائد السنية من خواص الاشجار الطبية الافرنجية

A treatise on the properties of the newly introduced medicines.

Author:—Aḥmad Luṭf-Allāh Efendi. (?)

The work has been translated from Turkish as stated in the Colophon. For details and another copy see O. P. Lib. Cat. Vol. IV, p. 174, xviii. Written in Naskh. Dated Mecca, 1150 A.H.

Beg:—الحمد ... فاقول ان طائفة الافرنج - الخ

(Wājid Hu., Yahya Ganj, Lucknow.)

118.

القلويح الى اسرار التمتع

The third abridgment of *Qānūn* of Abū 'Alī al-Hu. B. 'Abd-Allāh B. Sīnā, called al-Shaykh al-Ra'is, the most celebrated Arabian philosopher and physician, better known in Europe by the name of Anicenna, who died in A.H. 428 = A.D. 1037, in his 58th year.

Commentator:—Fakhr al-Dīn al-Khujandī. (?) One copy of the Commentary is in Paris: see Brock., Vol. I, p. 458. One copy is in the Bankipore Lib.: see Cat., Vol. IV, p. 100; and one copy is in the A.S.B.: see Gov. Ind. Coll., Part I, No. 229, p. 14. Written in elegant Nasta'liq. Not dated.

(Nizām Lib., Hyderabad.)

XXIV.

MILITARY ARTS.

119.

كتاب الحيل المكيد في فن الحرب

A unique work on the military arts and the use of weapons, without author's name. It is divided into six treatises as enumerated in the preface of the MS. There are numerous coloured drawings representing the various instruments of war. Written in old Naskh. Not dated.

الحمد لله الحق المبين ... الباب الاول في ان نظام البشر في :— Beg

الحرب الخ

(Nizām Lib., Hyderabad.)

XXV.

INTERPRETATION OF DREAMS.

120.

الاستيناس في تأويل منام الناس

A work on the interpretation of dreams.

Author:—‘Abd al-Mu‘tī B. Salīm B. ‘Umar al-Shiblī al-Simlāvi, who flourished in the 11th century of the Hijrah. See Cairo Lib. Ar. Cat., Vol. IV, p. 219. For author and his other works see Berl. Lib. Ar. Cat., Nos. 3202, 4679, Brock., Vol. I, p. 44, and Cat. Br. Mus. Ar. Books, Vol. I, p. 235. Autograph copy. Written in Naskh. Dated 1090 A.H.

Beg :— الحمد لله الذي صير الروية الصالحة جارية في سائر الليالي الخ

(Ahli-Islām Lib., Madras.)

SUPPLEMENTARY LIST OF ARABIC MSS.

121.

قرآن شريف

This copy of the *Qur’ān* is due to the penmanship of ‘Abd al-Qādir al-Husaynī who probably flourished in the 11th century of the Hijrah. The weight of the MS. sufficiently speaks of the quantity of gold used in it. It is exceedingly valuable on account of the profuse illuminations and ornamentations and beautiful designs in gold throughout. Written in bold Naskh.

This copy was kindly lent by Nawwāb-zādah *Khusraw* Mirzā of Murshidabad to the A.S.B. for Exhibition held on the 3rd February, 1915 A.D.

122.

قرآن

This copy of the *Qur’ān* with a Persian commentary on the margin is exceedingly valuable on account of its profuse illuminations and ornamentations. It is written in two different characters, viz. *Thulth* and *Naskh* (c. 900 A.H.).

(O.P. Lib., Bankipore.)

VARIOUS READINGS AND ORTHOGRAPHY.

123.

الحجة في القراءة السبعة

Volume I of the above work treating of the various readings of the seven recognized Qur'an-readers, imperfect at the beginning, by Abū 'Alī al-Ḥasan B. Aḥmad B. 'Abd al-Ghaffār al-Farsī al-Naḥvi (d. A.H. 377 = A.D. 987). For author and his other works see Brock., Vol. I, p. 113.

The testimonies of the recognized Qur'an-readers, Ḥuffāz and learned men of the 5th century of the Hijrah are on the fly-leaf of the MS.

Volume II of this work of the same date is in the Lib., but it is also defective at the end. Written in Naskh (c. 500 A.H.).

Beginning abruptly: — فاتحة الكتاب اختلفوا - الخ

(O.P. Lib., Bankipore.)

124.

العنوان في القراءة السبع

A work on the same subject, by Abū Tāhir Ismā'il B. Khalaf, B. Sa'id al-Ṣaḡalī al-Maqarrī (d. A.H. 455 = A.D. 1063). See Brock., Vol. I, p. 407. Only one copy is in the Berl. Lib. See Ar. Cat., Vol. I, No. 591. In the Hand-list of the Bānkipore O.P. Lib. the work is wrongly styled العيون instead of العنوان. Compare Hand-list, p. 17, No. 151.

The testimonies of the recognized Qur'an-readers, Ḥuffāz and learned men of the 6th century of the Hijrah are the colophon of the MS. Written in Naskh. Dated 652 A.H.

Scribe:—'Abd al-Qavī B. 'Abd-Allāh B. Ibrāhīm B. Md. al-Anmāṭī al-Sa'dī.

قال الشيخ ابو طاهر - الحمد لله الذي انشأنا بقدرته وهدانا -
للاسلام ونطرتة - اما بعد فاني ذاك الخ

(O.P. Lib., Bankipore.)

125.

تنبية الوسنان بتمزيه القرآن

An extensive work on the same subject, by Ashraf B. Tabīb B. Mawlā Taqī al-Dīn Ḥaydar al-Qarkhī, a teacher in

the Jāmi' Akbar at Kashmīr. Written in neat Naskh. Headings with rubrications. No date.

Beg:— الحمد لله الذي هدانا لهذا وما كنا لنهتدي لغيره

(Md. Muḥaddith Lib., Rampore.)

COMMENTARIES ON THE QUR'ĀN.

126.

انوار الفرقان وازهار القرآن

A Commentary upon the first seven and half chapters (viz. from سورة الفاتحة to سورة الاعراف) of the *Qur'ān*, by Ghulām Naqshband, known al-Shāfi'i. Composed in 1110 A.H. as appears from the following chronogram of a latter composition:—

سيختم بشرى ان هذا العامة (هذى لعامة)
 يفادي على قولي و ذاك سيختم
 فعليك شيخ القوم لله ختمه
 والله ختمه في سر معظم

For author and his another work see No. 97.

Written in good Naskh (c. 1200 A.H.).

Scribe:—Md. Itifāt Mubāriz Khān of Loharpore.

Beg:— الحمد لله الذي جعل الفرقان نورا للهدى الخ

(Aḥmad-Allāh Lib., Muradabad.)

127.

التبيان في التفسير

An old copy of the Commentary upon the *Qur'ān*, by Ab ū Ja'far Md. B. al-Ḥasan al-Ṭūsī (d. A.H. 459 = A.D. 1067). For author see Brock., Vol. I, p. 405, *Fihras al-Ṭūsī*, pp. 285-288, edited by Mr. Sprenger.

Written in very good Naskh.

Scribe:—Abu'l Ḥasan B. Hājī Hu. Fahtāji al-Ṭibsi al-Iṣfahānī.

Beg:— الحمد لله اعترافا بتوحيده و اخلاصا بربوبيته - الخ

(Md. Ibrāhīm Lib., Lucknow.)

128.

المجاز

A Commentary on the *Qur'ān*, by 'Izz al-Dīn 'Abd al-Salām B. Aḥmad B. Ghāmir al-Maqdisi (d. c. A.H. 678 = A.D. 1279). For author and his other works see Brock., Vol. I, p. 450. There are two parts of the work. First part is defective at the beginning. Written in Naskh. Dated 687 A.H.

(O.P. Lib., Bankipore.)

129.

منتور الدرر في فضائل السور

An abridgment of الدر المنثور, a Commentary upon the *Qur'ān*, by 'Abd al-Rahmān al-Suyūṭī (d. A.H. 911 = A.D. 1505). See Br. Mus. Suppl. Ar. Cat. No. 125.

Author:—'Abd al-Aḥad B. Shaykh Md. Sirhindi al-Hanafī (?) Written in Shikastah. No date.

Beg:—الحمد لله وسلام على عباده الذين اصطفى والذين هموا مطابقة (متابعة) المصطفى

(Muḥammad Muḥaddith Lib., Rampore.)

130.

الهادي و مصباح النادي

A Commentary upon the *Qur'ān* according to the Shī'ah Sect.

Commentator:—Sayyid Hāshim B. Sulaymān B. Ismā'il B. 'Abd al-Jawād al-Katkānī (d. A.H. 1107 = A.D. 1695). Composed in 1077. The preface is divided into a مقدمة and 12 chapters (باب). See *Amal al-Āmil*, p. 73, for author.

Beg:—الحمد لله وسلام على عباده الذين اصطفى الخ

Scribe:—'Izzat-Allah B. Md. Hu. 'Abbāsī.

Written in Naskh. Dated 1130 A.H.

(Md. Ibrāhīm Lib., Lucknow.)

GLOSSARY.

131.

كتاب الغريبين

A very old copy of the well-known glossary of the rare and difficult words used in the *Hadith* and *Qur'ān*, by Aḥmad

B. Md. al-Hiravī (d. A.H. 401 = A.D. 1010). For details see H. Kh., Vol. IV, pp. 324-26. For other copies see Brock., Vol. I, p. 131. Written in Arabic Naskh. Dated 528 A.H. :—

فرغ من نسخة في يوم الاثنين الخامس من شهر الله الأعظم الله بركته من
سنة ثمان عشر وخمسمائة

Scribe :—Abu'd Dāmin B. Ghālib B. Abī Naṣr.

(Shāh Ḥabīb Ḥaydar Lib., Kākūrī, Lucknow.)

132.

الكفاية في معرفة اصول علم الرواية

A work on the Science of Tradition, by Abū Bakr Aḥmad B. 'Alī B. Khaṭīb al-Baghdādī (d. A.H. 403 = A.D. 1071). See for details Brock., Vol. I, p. 329, H. Kh., Vol. V, p. 222, and Berl. Lib. Ar. Cat. No. 1034.

Written in Naskh (c. 600 A.H.) ; 6th and 7th parts of the work are in the Lib.

Part VI, beginning abruptly :—

مددوق موثمن به الخ

„ VII, beginning :—

اخبرنا الشيخ ابو الحسن محمد بن مرزوق

بن عبد الرزاق الخ

(O.P. Lib., Bankipore.)

THEOLOGY.

133.

رسالة في العقائد

A theological work, by 'Uthmān al-Qurayshī, composed in A.H. 996. Written in Arabic Naskh. Dated A.H. 1020.

Scribe :—Ghafūr B. Shaykh Sharaf al-Dīn al-Qurayshī al-Ḥanafī.

Beg :—الحمد لله الذي على ما علينا (مفحننا) قواعد العقائد الدينيته
وخولنا بلطفه قواعد المعارف اليقينية

(M. Md. Muḥaddith Lib., Rampore.)

134.

الصحيفة الكاملة

A very interesting copy of the famous Prayer Book of 'Alī B. al-Hu. B. 'Alī B. Abū Tālib (d. A.H. 95 = A.D. 713). Written

by Md. B. Makki al-'Āmulī al-Shahīd (d. A.H. 787 = A.D. 1385). See for scribe No. 137. From the colophon it appears that the MS. was collated with a copy dated 601 A.H. Written in Arabic Naskh.

(Md. Ibrāhīm Lib., Lucknow.)

135.

إشراحات المعالمة

A Commentary upon the well-known *Uṣūl al-Fiqh* منار الانوار of 'Abd-Allāh B. Aḥmad al-Nasafī (d. A.H. 710 = A.D. 1310).

Commentator:—Mullā 'Abd al-Salām of Dīvāh. The author flourished in the time of Shāhjahān (1037 A.H.—1068 A.H.). See for author and his works *Kashf al-Mutawarī fī Hāl-i-Nizām al-Dīn al-Qārī*, printed copy p. 136, *Ma'āthir al-Kirām* of Āzād Bilgrāmī, p. 235, and *Tazkirah-i-Ulamā-i-Hind* by Raḥmān 'Alī, p. 120.

Written in Ta'liq (c. 1200 A.H.).

Beg: — شهد الله انه لا اله الا هو (الآ هو) والملكة واولو العلم قائما بالقسط الخ

(Shāh Ḥabīb Ḥaydar Lib., Kārkūrī, Lucknow.)

JURISPRUDENCE.

136.

تحفة الفقهاء

A work on jurisprudence, by 'Abd al-Ghafūr Mubārak B. 'Abd al-Haqq B. Nūr (?). The work is divided into 24 chapters. Written in clear Naskh. (c. 1200 A.H.).

Beg: — نعمدك يا من شرح صدورنا ... فيقول خويدم عبد الله
الروغف عبد الغفور الخ

(Aḥmad Allāh Lib., Muradabad.)

137.

شرح اللمعة (الروضة البهيمة)

A well-known commentary by Zayn al-Dīn B. 'Alī B. Aḥmad al-Shāmī al-'Āmilī (d. A.H. 966 = A.D. 1558); see *Shuzūr al-Iqyān*, fol. 143, and *Rawḍāt al-Jannāt*, p. 528, upon a treatise on the Shī'ah Law, by Shahīd B. Md. B. Makki (d. A.H. 787 = A.D. 1385).

On the margin of fol. 162 is a note in ten lines written by

Md. Bāqir. Majlisī (d. A.H. 1111 = A.D. 1699), see *Shuṣūr al-'Iqyān*, fol. 56.

(Md. Ibrāhīm Lib., Lucknow.)

138.

مختار الفتاوى

A work on Muhammadan Law of the Ḥanafī School, by Md. B. Aḥmad B. Md. al-Tāhiri (?). Written in Ta'liq (c. 1200 A.H.). The work is slightly defective at the end.

Beg :— الحمد لله الذي غرقت في بحار عظمته اوهام العلماء الخ

(Aḥmad-Allāh Lib., Muradabad.)

139.

ملتقى الابحر

A valuable and autograph copy of a well-known work on the Furū' according to the Ḥanafī School, by Ibrāhīm B. Md. B. Ibrāhīm al-Ḥalabī (d. A.H. 956 = A.D. 1549). Composed in A.H. 923 :—

و لله الحمد على يد جامعة الفقير ابراهيم بن محمد بن ابراهيم
الحلبى بعد العصر من يوم الاثنين اربع جمادى الاخرى سنة تسع و عشرون
و تسعمائة بمدينة قسطنطينية

The above colophon shows that the work is an autograph copy written by the author at Constantinople in A.H. 929. The work is written in fine small Ta'liq within gold-ruled borders. The headings are written in red. 'Unwān illuminated.

(Imperial Lib.)

HISTORY.

140.

العوارف لانواع المعارف

A work on Islamic history relating to education and literature in India, and contains an introduction, 4 chapters, many parts and an appendix.

Author :—M. Ḥakīm 'Abd al-Hayy.

Written in clear Ta'liq.

Beg :— كان الغرض من وضع كتابنا نزهة الخواطر ببيان اخبار العلماء

(See Lib. No. 5.)

141.

كتاب المعارف

A very old copy of the well-known manual of early Muslim history and biography by the famous 'Abd-Allāh B. Qutaybah (d. A.H. 276 = A.D. 889). For details see Br. Mus. Suppl. Ar. Cat. No. 447. The headings are written in Kūfī character. Written in Arabic Naskh. Dated 500 A.H. Some pages are wanting at the beginning. Time-worn.

I saw it at Lucknow in the possession of a book-seller. Subsequently I found it in the Rampore State Lib.

Lith. Gottingen 1850 A.D. and Cairo 1883 A.D. See Cat. Ar. Books. Br. Mus., Vol. I, p. 17.

(Rampore State Lib.)

BIOGRAPHIES.

142.

اعلام الاخير من فقهاء مذهب النعمان المختار

The work contains the history of Muhammadan Law and the biographies of the early and modern jurists of the Hanafi School by Md. B. Sulaymān al-Kafavī who died in A.H. 990 = A.D. 1582. Ahlwardt gives Mahmūd instead of Md., see Berl. Lib. Ar. Cat., Vol. IX, No. 10027, where the title of the work is given كفتاب اعلام الاخير.

Brockelmann has misspelt the *A'lām* and omitted to refer to the Berl. Lib. Cat.; *vide* Brock., Vol. II, p. 83.

The work is written in usual Ta'liq. Transcribed from the copy of Md. Diyā' al-Dīn of Chawgharyā of Burdwān. Dated A.H. 1282.

Beg:—

الحمد لله الذي ارسل رسوله بالهدى - الخ

(Imperial Lib.)

143.

نزهة الخواطر وبهجة المسامع والنواظر

The work contains eight volumes divided into 14 chapters. Each chapter is assigned to a century and contains the biographies of the learned men who flourished in India in that century. There are about 3,300 biographies of the learned and eminent Muslims who lived from the 7th to the 20th centuries.

Author:—M. Hakīm 'Abd al-Hayy.

Written in clear Ta'liq.

Beg :— الحمد لله الذي خلق الإنسان وعلمه البيان الخ

(See Lib. No. 5.)

144.

تلخيص المقال

A dictionary of the Shī'ah Traditionists, by Md. B. 'Alī al-Astrābādī (d. A.H. 1028 = A.D. 1619). Composed in 988 A.H.

It is transcribed from the author's copy in 1090 A.H.

For details and other copies see Brock., Vol. II, p. 385, and *Amal al-Āmil*, p. 45.

Scribe :—Mas'ūd B. Badī'. Written in Naskh.

(Md. Ibrāhīm Lib., Lucknow.)

145.

تهذيب الاسماء واللغات

The famous biographical dictionary of illustrious men, chiefly of those who flourished in the beginning of Islamism, by Yahyā B. Sharaf al-Nawawī (d. A.H. 676 = A.D. 1218). For details see Brock., Vol. I, p. 394, *Iktifā' al-Qunū'*, p. 10, and H. Kh., Vol. II, p. 477. The work is printed. See Br. Mus. Ar. Books Cat. Written in old Naskh (c. 700 A.H.). It is an incomplete copy. The headings are written with rubrications.

(Md. Muḥaddith Lib., Rampore.)

146.

حالات بعض علمای هندوستان

Short biographies of the latest 'Ulamā' and Shaykhs of India, by Md. Ashraf (?). Arranged in alphabetical order.

The author probably flourished in the 12th century of the Hijrah.

Written in Ta'liq Shikastah Āmīz (c. 1300 A.H.).

Beg :— [احمد تھانیسری] وهو عالم يشبه الآلي تحريه

(Shāh Ḥabīb Ḥaydar Lib., Kākūrī, Lucknow.)

147.

شذور العقیان

Notices on the Shī'ah 'Ulamā', who flourished in the early and later times, with their works, by I'jāz Ḥusayn Kantūrī

(d. A.H. 1286 = A.D. 1869). Arranged in alphabetical order. Two other copies are in Lucknow, one in Nāsir Hu. Lib., one in Md. Ibrāhīm Lib. One in the Buhār Coll. Imp. Lib. and one in Rampore State Lib. Written in good Naskh (c. 1300 A.H.).

الحمد لله رافع الدرجات (درجات) العلماء والمقيض على من:—
احيا ذكرهم

(M. Sakhāwal-Hu. Lib., Lucknow.)

GEOGRAPHY.

148.

جنة المشرق و مطلع النور المشرق

The work contains three parts. The first part is on geography, the second part on history, and the third part on politics. The first part contains an introduction and 4 chapters, which deal particularly with the geography of India. The second part contains 10 chapters. The third part contains 10 chapters and many sections.

Author:—M. Hakīm 'Abd al-Hayy.

Written in clear Ta'liq.

الحمد لله الذي خلق الانسان من طين ثم جعل نسله من:—
سلالة من ماء مهين الخ

(See Lib. No. 5.)

PHILOLOGY.

149.

مفتاح اللسان

A treatise on Arabic colloquialism, by Awḥad al-Dīn Aḥmad, dedicated to Faqīr Md. Khān Bahādur (?). Written in good Ta'liq (c. 1300 A.H.).

Beg:— يا من دلح السحر لسانه لتلاوة آيات يدل على ذاته الخ

(Md. Muḥaddith Lib., Rampore.)

GRAMMAR.

150.

رضي شرح كافيه

A very valuable commentary of Raḍī al-Dīn Md. (d. A.H. 687 = A.D. 1287) upon the Kāfiyah, a well-known grammar of Ibn al-Hājib (d. 646 A.H.). For details see H. Kh., Vol. V, p. 6, and Brock., Vol. I, p. 303.

Copyist:—Sa'd-Allāh Khān (d. A.H. 1066 = A.D. 1655), who was the most able and upright minister of the emperor Shāh-jahān. The following lines on the first fol. are in the hand-writing of Shāh-jahān (A.H. 1037-1068 = A.D. 1627-1657).

این کتاب شرح رضی وحاشیه آن نیز خط سعد الله خان مرحوم
و مغفور است - در غرض شهر رجب المرجب داخل کتاب خانه این نیازمند درگاه
شد - حرره شهاب الدین محمد صاحبقران ثانی شاهی بادشاه -

(Rampore State Lib.)

ORNATE PROSE AND POETRY.

151.

رساله خدریه

A short autobiography of Fād-i-Haqq B. Fād-i-Imām, a well-known learned Mawlānā of Khayrābād, who died while in transportation at Rangoon in 1278 A.H. In the course of his narrative the author records important events of the Mutiny of 1857 A.D. and mentions the troubles and pains which he suffered during the time of his expatriation. For author's life and his works see *Hadā'iq al-Hanafīyah* of Faqīr Md., p. 480.

Written in Ta'liq by Ḥasan Muḥaddith, the father of the owner of the Lib., with useful explanatory notes. The MS. contains two Qasīdahs at the end.

Beg: — الحمد لله عظیم الرجاء للانجاء من دون الارجاء من الجلودى الخ

(M. Md. Muḥaddith Lib., Rampore.)

152.

السبعة السیارة

A very interesting copy of the poetical works of the celebrated Indian scholar-poet Ghulām 'Alī Āzād of Bilgrām (d. A.H. 120 = A.D. 1785), containing seven Dīwāns. Penned by himself. The author commenced the work in 1179 A.H. and finished in 1194 A.H. The following note at the end of the work is an autograph:—

انا الفقير آزاد الحسيني الواسطي البلگرامي
Two Dīwāns were published in Hyderabad some years ago. They are full of misprints.

Written in minute Ta'liq Shikastah Āmiz.

Beg: — لمحت الي بعينها الكحلء - الخ

(Nawwāb Nūr al-Ḥasan Lib., Lucknow.)

THE FOURTH INDIAN SCIENCE CONGRESS, BANGALORE, JANUARY 1917.

The Fourth Indian Science Congress was held in Bangalore on January 10th, 11th, 12th and 13th, 1917, under the presidency of Sir Alfred Bourne, K.C.I.E., D.Sc., F.R.S. The meeting was attended by about 270 members and some 70 papers were communicated, abstracts of which are given below.

The Patron of the Congress, H.H. the Maharajah of Mysore, G.C.S.I., was present at the opening meeting and welcomed the visitors in a felicitous speech.

Presidential Address.

By SIR ALFRED GIBBS BOURNE, D.Sc., F.R.S., K.C.I.E.

YOUR HIGHNESS,

My first duty is the very pleasant one of saying, on behalf of the members of this Congress, how much we value the honour Your Highness has done us in consenting to be our Patron and in coming here to preside at our opening meeting. Many of our members have come from distant parts of India and are paying their first visit to the State of Mysore; the interest of this visit is greatly enhanced by the pleasure of seeing Your Highness in person.

LADIES AND GENTLEMEN,

Before going further may I say how greatly I appreciate the honour of my new position as President of this Congress, a most unexpected honour as it is now fifteen years since I was caught up by the great wheels of administration and had during that time very little leisure or energy to devote to scientific work. This is one reason among others why I cannot follow in the footsteps of my distinguished predecessor and offer you, as he did, an intellectual treat.

I had, at first, hoped it would be possible for me to attempt some review of the history of science in India; and though I have been compelled to give up that idea as impracticable, I should like to express my gratitude to Mr. K. V. Rangaswami Aiyengar of Trivandrum for the notes which he kindly compiled for me on the science handed down to us in Sanskrit literature. I make one quotation from these notes now; its bearing on my own remarks will be evident later. After pointing out that no scientific treatises in Sanskrit have come down which deal with the subject matter of any of the Physical Sciences in the direct modern manner, he says: "Even in such cases as those of Indian Astronomy and Mathematics, we find the purely scienti-

fic aim subordinated to the practical and the subjects treated of as incidental to the consideration of practical arts like Mensuration or Judicial Astrology." I am not quite clear as to what Judicial Astrology is, but we shall doubtless agree that it is not pure science.

I was particularly anxious that the Congress should meet in Bangalore in order to give its members the opportunity of becoming acquainted with the Indian Institute of Science, that they might see for themselves what has been so far the outcome of Mr. J. N. Tata's unique beneficent intention and what immense possibilities there are for the future, if others would follow his excellent example.

Unfortunately, the Institute itself is not a suitable place for the holding of our meetings owing to the lack of sufficient accommodation for visitors on the spot and the difficulties of transit to and fro. It is, however, an ill wind that blows no one any good, and as things are we have the pleasure of accepting the hospitality of His Highness' Government and of seeing at leisure the very excellent arrangements made in this so well termed go-ahead State for the teaching and practice of science.

This is the fourth meeting of this Congress, and I think you will all join me in congratulating those who have worked so hard to bring such a Congress into being. Although Dr. Simonsen of Madras and Mr. MacMahon of Lucknow are perhaps responsible for its conception, the Congress has hitherto found a complaisant foster-father in the old established Asiatic Society of Bengal, and it may become permanently established as a peripatetic form of activity of that Society. That Society began life under the auspices of Sir William Jones, and he wisely urged at its inaugural meeting that there should be no rules, and for a long time there were no rules and the Society flourished without them. There is, however, little doubt that he made what were virtually rules, although not so-called, as occasion required. A founder may do this but every Society that persists beyond the time of its founder finds the need for some rules however few and simple. This Congress has managed fairly well up to now without any, but one of the matters which will be brought before you at the present meeting will be the desirability of some simple constitution. We are indeed to have a discussion with regard to its future, and I venture in the first place to offer a few comments and suggestions bearing upon the Congress.

The body to which the Congress most nearly corresponds is the British Association for the Advancement of Science. Such an organization found its place in the Salomon's House of Bacon's fable wherein they had "Circuites or Visits of Divers Principall Citties of the Kingdome, wher, as it commeth to passe, wee doe publish such New Profitable Inventions, as wee thinke good."

Like the British Association we may, I think, safely say that we contemplate no interference with the ground occupied by other institutions.

The objects of the British Association were at the outset declared to be:—

“To give a stronger impulse and a more systematic direction to scientific enquiry,—

to promote the intercourse of those who cultivate science in different parts of the British Empire, with one another and with foreign philosophers,—

to obtain a more general attention to the objects of science, and a removal of any disadvantages of a public kind which impede its progress.”

These have remained its avowed objects for 85 years.

To speak of the last of these first, it has not the force now which it had in the early part of last century. There may still be comparatively few “whose favoured steps the lamp of science through the jealous maze of nature guides,” but there is no comparison between the amount of general attention the objects of science now receive and the state of things in 1831. So far as a general appreciation of science, its aims and methods was concerned, those days were not so very very far removed from the time when “chymistes were distillers of waters,” or people who “turned”—or were supposed to turn—“everything into silver,” or perhaps in the East from the time when “the most eager search was the transmutation of metals and the elixir of immortal health.” Indeed, within the year just closed a gentleman came to the Institute of Science to show us how to obtain gold from egg-shells, and not long ago I received a postal order of no small amount with a request that the value might be remitted in boxes of our best brain pills

Science of some sort is now being very widely taught at all stages of education, and so far from its progress being impeded as used to be the case by disadvantages of a public kind, most Governments are more or less alive to the importance of devoting public funds in furtherance of scientific work and almost every Honours list now contains the names of men distinguished in science.

In this country the various Governments have made a very fair beginning in the matter of funds.

It is impossible and would be of little value for our purposes to estimate the amount devoted to scientific teaching in schools and colleges by the various Education Departments. I have, however, endeavoured, with the kind assistance of the Hon'ble Mr. Davidson and the Financial Department of the Government of Madras, to form some idea of the amount being spent upon original research and other higher scientific work throughout the country.

With the nature and essence of "research" I propose to offer a few observations later on, but it is not without interest to note at this point the connections in which the word occurs in the various budget estimates. The Government of India support a Forest *Research* Institute and College at Dehra Dun, and devote about 4 lakhs a year to it; they contribute 5 lakhs a year to the Indian *Research* Fund, about 5½ lakhs to the Agricultural *Research* Institute at Pusa, and a lakh to the Central *Research* Institute at Kasauli.

Some of the local Governments have entertained, or propose to entertain, what they call in the budget, Forest *Research* Officers. The Agricultural College in the Madras Presidency has, for part of its title, that of *Research* Institute. The Government of Bengal give *research* scholarships. The Punjab Government enter a small portion of their contribution to Government Colleges as *research* grant. In Burma a small sum is devoted to what are called Leprosy *researches*.

The budgets, however, provide for many other forms of scientific activity in connection with which the word *research* does not happen to have been used, such as:—further experimental work in connection with agriculture, bacteriological work as affecting man and animals, other investigations of a medical nature, and work relating to fisheries and other industries.

Further, various Governments support Museums in some of which, at any rate, scientific work is carried on, and our Institute here at Bangalore receives an annual grant of Rs. 87,500 from the Government of India who have promised, should any private individual be willing to subscribe, to provide a like amount so long as their total grant does not exceed Rs. 1,50,000.

Lastly, there are the various Imperial Surveys; in some of these the expenditure must, of course, be mainly debited to administrative work, but in the majority of them the funds do something towards the progress of science.

In all these ways and without taking the Surveys into account the annual expenditure from public funds on scientific work in British India is somewhere in the neighbourhood of Rs. 70—80 lakhs, that is to say, £500,000; and to this must, of course, be added large capital sums invested in buildings. I have the exact figures under each head but the difficulty comes when one endeavours to pick out the expenditure resulting in additions to scientific knowledge, and I have given the Government the benefit of the doubt in the majority of the doubtful cases.

This expenditure is supplemented to some extent by the more progressive of the Native States, including, I need hardly say, the State in which we have the pleasure to be at present.

Lastly, private sources have contributed but to a lamenta-

bly small extent. In this latter respect there have been a few striking exceptions, and perhaps the foremost of these was the projected gift of the late Mr. Tata to the carrying out of which by his sons our Institute owes its existence.

So far as Government contributions are concerned, I must leave it to others interested to make more exact calculations, particularly with a view to deciding what share of this expenditure is intended to make for progress in science and to institute comparisons with similar efforts in other countries. I cannot arrive at any total for expenditure in Great Britain on corresponding objects, but I note that, at the opening of the National Physical Laboratory in England in 1902, His Majesty the King, then Prince of Wales, expressed the belief that it was "almost the first instance of the State taking part in scientific research," and that the capital grant towards that laboratory was £13,000 (*viz.* under two lakhs), and that the annual allowance towards its maintenance was £4,000 (0.6 lakh in our budget terminology), while the only other sum mentioned by the recently appointed Advisory Council as a State contribution of any magnitude in the pre-war period of the present century, is an annual subsidy of £20,000 (since increased to £30,000) to the Imperial College of Science and Technology at South Kensington. I would ask you to compare these figures so far as they go, on the one hand with those I have just given for some individual institutions in India, and, on the other, with the amount that must have been contributed from private sources in England.

I do not ask you to make any odious comparison with what has been spent by any State in Central Europe but would remind you of a private benefaction in another continent of about 22 million dollars yielding an *annual* income of what amounts to over Rs. 30 lakhs in our currency.

I do not intend to dwell further on finance, nor need I linger over the other ways in which science has obtained recognition in recent years, but it is clear that much has been done not only to remove disadvantages of a public kind but actually to further the progress of science, since the Association we have taken as a model was founded. This Congress may now do its share.

With regard to the first object of the British Association, *viz.* to give a stronger impulse and a more systematic direction to scientific enquiry, I would ask this Congress to consider how it can secure this stronger impulse, and particularly, a more systematic direction.

It seems doubtful whether much will be done in this respect if the programme continues to be limited to an address from the President, a few public lectures; and for the rest, meetings in small sections for the reading of papers some of which, I gather from past proceedings, have been mere preliminary

notes, while others, although valuable contributions to science, are of immediate interest to very few.

I am not instituting any comparison, invidious or otherwise, in this respect with the British Association, but should like to point out that from its foundation onwards some of the most important work of that body is to be found in the "Reports on the State of Science." The Board of Scientific Advice in India has, it is true, for several years published an Annual Report, and in some subjects this gives a very fair idea of the progress during the year, but in others it is little more than an extract from some administration report, and there seems to be no attempt at co-ordination nor any endeavour to formulate desiderata.

In these days of increasing specialization great effort ought to be made by those working at one subject to get some notion of the progress in others. To make one or two suggestions, there might be some greater effort at combined meetings to deal with subjects in which all or most scientific men must take some interest; there might be permanent committees dealing with specific problems, and the President of each Section, if you must have Sections, might endeavour to review recent work in his subject. This latter is indeed frequently done, but as these addresses are usually all delivered at the same hour they are for the most part listened to only by those who best know beforehand what that work has been.

The other object which the British Association sets before itself, *viz.* to promote the intercourse of those who cultivate science in different parts of the British Empire with one another and with foreign philosophers, has always seemed to me, even taken alone, to justify the annual meeting; but here again the object would be more fully attained, were something arranged other than that the agriculturalists should shut themselves up in one room, the chemists in another, while the devotees of Natural Science segregate themselves in various ways and pay very scant attention even to one another. I can quite sympathise with the botanist failing to appreciate the beauty of a paper "On a Cubic Surface referred to a Pentad of Co-tangential Points," or the chemist being somewhat bored by a disquisition "On the Aberrant Form of the Sacrum connected with Naegele's Obliquely Contracted Pelvis," but is an Association or Congress with its rare opportunity of meeting a number of fellow-workers in science, albeit in other branches, a suitable occasion for such papers?

Should not some attempt be made throughout the meeting to deal with subjects intelligible to all students of science alike? There must be something in the complaint recently made by Prof. Armstrong that a science nowadays may develop a special language threatening to estrange the users altogether from common knowledge and sympathy, and some

of us fully appreciate the demand he quotes "that chemists should talk common sense in the vulgar tongue.

Should not such meetings as this be almost entirely devoted to the bringing together all the time of all the scientists present?

To quote the hitherto unborn words of the memorandum to be presented by my Council to the Industries Commission, "the isolation hitherto experienced by many scientific workers in India has been one of the chief reasons of the comparatively disappointing results."

Now if you will bear with me a little longer, I propose to revert to the question of research.

I have already drawn your attention to the frequent use of the term "research" in the Government budgets of the day. Look only a few years back and you will hardly find it in these documents. I have not been at any pains to measure the increase of frequency in the general use of the word but it is certain that it is now being continually brought before a public few of whom concerned themselves much with the matter in the very recent past.

Research is now alluded to as a perfectly simple operation. one even hears of men being "taught to research"; newspapers speak of it in the lightest manner, whereas, in even my student days, it was spoken of with almost bated breath as indicating something to which only the best of us could look forward, something which few of us were ever likely to carry on with any hope of success. How well I remember my own first piece of original work and the months I spent in trying to ascertain the structure of an organ little more than just visible to the naked eye and the excitement of trying to unravel its extreme complexity. My impression is that the term was at that time used almost entirely in connection with the pure science, but even in this respect it is now quite a common thing for a candidate for a higher degree in science to be expected to present a thesis based upon some original research, and there is a Professor in this country who, so I have been told, expects and helps each of his students to "turn out a research," to use a now common expression, every month. This may or may not be true. If true, it bespeaks considerable energy; how far it makes for progress authorities in the subject alone can say—at any rate it may serve as an example of how things have changed.

Then again instead of there being one or two isolated cases of Institutions professedly devoted to research such Institutions are now quite common. Some of these I have already alluded to, including that which is perhaps the most ambitious of all—The Carnegie Institution of Washington, founded by Andrew Carnegie "to encourage in the broadest and most liberal manner

investigation, research and discovery, and the application of knowledge to the improvement of mankind."

Perhaps the most striking and modern example of the use of the term has been the name given to the recently appointed Committee of the Privy Council—a Committee for Scientific and Industrial Research. This has still more recently become a separate Department of State and bids fair to influence profoundly the position of research. I have based some of my remarks upon the instructive report lately issued by the Advisory Council of that Committee.

As this is a Science Congress there are probably few present to whom this will not be the merest commonplace, but there seem to be many people in this and in other countries who have not yet fully realized that the word "research" is now in use in ways that differ greatly from one another. Almost all investigation is now spoken of as research. This is doubtless verbally correct; but the motive directing the investigation and the spirit in which it is carried out vary, and it seems desirable to emphasize the variations.

The Oxford Dictionary defines a researcher as "one who devotes himself to scientific or literary research (especially as contrasted, with one whose time is chiefly occupied in teaching or remunerative work)." The word "research" is now however very widely used in connection with remunerative work, that is to say, remunerative in a pecuniary sense.

The Advisory Council to which I have just referred quote the managing director of a manufacturing firm who stated that he had no interest in research which did not produce results within a year; it is evident that he meant results favourably affecting his own pocket.

Dr. Mees, the Director of the Research Laboratories of the Eastman Kodak Company, no doubt takes a wider view. His interesting paper has been published in *Nature*, but I take the following from the Advisory Council's report:—

"In this paper Dr. Mees points out that three grades of laboratory are needed by every manufacturer who wishes to get the best results from the application of science to his business. First he needs the ordinary routine or works laboratory for controlling the quality of raw materials, finished products and processes. Next he should have what Dr. Mees calls an industrial laboratory or, as it might perhaps be described, an efficiency laboratory where improvements in products and in processes tending to lessen cost of production and to introduce new products on the market are worked out. Valuable as this type of work is, it does not go to the root of things; the results it can give are strictly limited.

Fundamental developments in the whole subject in which a firm is interested require something very different from the

usual works laboratory. In every case where the effect of research work has been very marked, that work has been directed not towards the superficial processes of industry but towards the fundamental and underlying theory of the subject. The function of the third type of laboratory—the true research laboratory—is to formulate this underlying theory.

This kind of research work involves, Dr. Mees tells us, a laboratory very different from the usual works laboratory, and also investigations of a different type from those employed in a purely industrial laboratory. It means a large, elaborately equipped, and heavily staffed laboratory engaged largely on work which, for many years, will be unremunerative and which, for a considerable time after its foundation, will obtain no results at all which can be applied by the manufacturer. The shortest period in which any considerable results can be expected is five years, while results so considerable as to affect the whole industry cannot be looked for in less than ten years' consecutive work."

You will observe that even Dr. Mees' highest form of research that carried on in the true research laboratory as he calls it, is to be conducted with a view to remunerative results although these may be deferred for five or even ten years!

I would ask you to contrast this attitude with that indicated by Sir Ray Lankester in a lecture delivered at the meeting of the British Association in Sheffield. Lankester pointed out how different from "the eager practical spirit of the inventor who gains large pecuniary rewards" was "the devoted searching spirit of science which heedless of pecuniary rewards ever faces nature with a single purpose to ascertain the causes of things." "Invention," he said, "follows the footsteps of science at a distance. She is utterly devoid of that thriftless yearning after knowledge, that passionate desire to know the truth, which causes the unceasing advance of her guide and benefactress."

It is probably impossible to find a classification of research work devoid of considerable overlapping and in many cases the motives are undoubtedly mixed, but it seems possible to recognize three classes:—that carried on with the single purpose of ascertaining the truth in regard to the causes of things, that which has for its immediate object a specific utilitarian purpose but still without any expectation whatever of a pecuniarily remunerative result, and research with the avowed object of making money out of it sooner or later.

The first and second classes would come under the head of scientific research in the sense in which the term is used by the Privy Council, while the third class is industrial research; but what I want to emphasize is the fact that the first class alone is research in pure science, while the second and third classes are both research in applied science, that is science put to

practical use; practical as distinguished from abstract or theoretical.

Huxley said that what people call applied science is nothing but the application of pure science to particular problems. The Advisory Council say that this no doubt is so; there are not two different kinds of science, at the same time they realize that they have to deal with the practical business world in whose eyes a real distinction seems to exist between pure science and applied science. There are, however, men in the business world who see more clearly. An American manufacturer pointed out only the other day that "there are no sharp lines to separate pure from applied, scientific from practical, useful from useless. If one attempts to divide past research in such a manner he finds that time entirely rubs out the lines of demarcation."

It is interesting to note in passing that the word applied is being increasingly used in connection with specific branches of science. I have been unable to trace the history of such usage. The term Applied Mathematics must have considerable antiquity. There have, for many years, been chairs of Applied Mechanics, Applied Physics, and Technical Chemistry, but I have failed to find any early use of the term Applied Chemistry. Some branches of science have an applied side with a special title, such as Economic Botany, others are in their very nature wholly applied, such as Agriculture and Medicine.

But whatever terms have been used, the application of scientific knowledge for the good of mankind is as old as that knowledge itself, and one may safely say that the majority of those who have attempted this application have not been swayed by any pecuniary motive. The scientific agriculturist is not in most cases the person into whose pockets comes the money secured by the use of better methods. Medical science in all its branches is, as I have just said, applied science and although the doctor may earn his living by means of fees, medical research is not undertaken from pecuniary motives. It has been for the most part the application to a particular problem of the scientific knowledge of the day, and there has, of course, been no such application with a more noble purpose. Still it is not pure science and there have often been medical men who have left further application to others while they have reverted to purely scientific problems.

Sir Francis Bacon in the fable already quoted seems to have had in mind pure science on the one hand and applied science on the other:—

"Wee have Three that try New Experiments such as themselves thinke good. These wee call Pioners or Miners.

* * *

Wee have Three that bend themselves, Looking into the Experiments of their Fellowes, and cast about how to draw

out of them Things of Use, and Practise for Man's life and Knowledge.

These wee call Dowry-men or Benefactours."

* * *

Observe who are the Benefactours, and in the use of this term we all doubtless most cordially agree; personally I would not have it supposed for one moment that I am belittling research even if undertaken from pecuniary motives, or would say one word to detract from its importance. All I maintain is that pure science must remain upon a pedestal and no utilitarian work can replace it.

Dr. Mees may talk of going to the root of things and of the fundamental and underlying theory of a subject in connection with his industrial research, but all this is, for the most part, mere superstructure based on pure scientific research.

What utilitarian research would have discovered the fundamental facts in regard to electricity or have led to the framing of the atomic theory? Who can say how many profound truths await discovery because some utilitarian who happened upon a glimmering of them did not think it worth while to pause and investigate the apparently irrelevant? In like case your "Pioneer or Miner" eager to ascertain the causes of all things would have asked no better lot than to follow up the faintly marked trail wheresoever it might lead, perchance in the end to the elucidation of some great truth susceptible of an application which might completely revolutionize the very subject upon which the utilitarian had been at work.

How much research has been undertaken by the student of pure science which he would have frankly admitted to be apparently useless! How much patient work and loving care have been bestowed upon investigations seemingly impossible of application to any of the specific problems of the day! Upon research of this kind no utilitarian would have been at all likely to embark, yet sooner or later such research has either proved capable of direct application or, and this has more often been the case, has unexpectedly formed a cornerstone, or occupied a more humble but still useful position, in building up some far-reaching generalization capable of being seized upon at once by the worker at applied science, thus in turn perhaps stimulating further scientific research.

It has been said that "even the brilliant experiments of Davy did not suffice to give any very great impetus towards further work at the subject until Ronalds constructed an electric telegraph, and in this and other ways pure electrical science received enormous impulses by the commercial applications of electricity." Thus according to Sir Frederick Bramwell "the applications of science and discoveries in pure science have acted and re-acted the one upon the other." No one can deny the existence of such action and reaction, but nevertheless it

remains true that each one of the modern practical applications of science, from wireless telegraphy to antitoxins, "had its foundations in purely scientific work, and was not the result of deliberate intention to make something of service to humanity." You will, I think, find evidence of this in the work from which I quote:—Professor Gregory's "Discovery; or the Spirit and Service of Science."

The immediate recognition of the value of applied work implied in the term "Dowry-men or Benefactors" does not, of course, trouble those with the "thrifless yearning": they have faith that sooner or later their work must fit in towards some useful purpose. We have heard of mathematicians who drink the toast "Here's to Pure Mathematics and may they never be of any use to anybody", but even they know that Mathematics rule and govern a great variety of subjects. Most students of pure science believe, to use weightier words than mine, that "you cannot get the science you desire for utilitarian ends by going straight for it. You must treat science with profound honour and respect and let her go on her own way. Then she will give you rich fruit; if you try to cripple and force and direct her to your own immediate ends she dries up and becomes a mere hag." Had there not been in the past men imbued with this spirit, there would have been no scientific knowledge to apply to any particular class of problem and any widely successful effort to wean the earnest student of pure science from his single purpose for any utilitarian end and above all by means of pecuniary reward must spell disaster for the distant future, and may hamper progress long ere that; but I cannot believe that a time will ever now come when there will not be many whose passionate desire to know the truth will rule them to the end.

This being so, it behoves even us devotees of pure science to do all we can to train and assist the race of "Dowry-men and Benefactors," and this is why I so strongly advocate the giving over of the Institute of Science to work of an applied character. We shall rejoice over any one in whom is born the passionate desire; but we must face the fact that men are wanted, and that in very large numbers, who will help the manufacturer, in the words of the Advisory Council, to overcome the difficulties that cross his path from day to day. The training of such men is indeed of the utmost importance if we are to emerge from the cloud that at present hangs over so many of our industries. A time is coming, we all devoutly hope that it may come soon, when things may return to their normal courses, but this cannot be until many years after this war is over. Then men of science all the world over can continue to pile up reserves in the way of knowledge, and we know that the *best* will remain "Pioneers and Miners." Now our greater need by far is for the "Dowry-men or Benefactors";

there are ample balances upon which to draw, balances inherited from the "Pioners or Miners" who have gone before.

I have spoken of the cloud that hangs over industries, but one cannot forget that even this is as nothing when the whole sky is overcast when young, middle-aged and old alike, men of science as well as others, are sacrificing everything, forsaking what have hitherto been their ideals, giving their very lives, for the sake of what they hold to be a righteous cause.

We, too, are doing the duty allotted to us and, precluded from more active help, must take what comfort we can from Milton's words:—"They also serve who only stand and wait."

My chief duty, as your President, is now over.

I fear I may have very partially succeeded in putting before you my own somewhat conflicting thoughts but it seems to me that a new danger of misconception in regard to science may loom large in the near future,—pure science may be almost submerged for a time by a wave of utilitarianism and it will require concerted and sustained effort to make people see things in their proper proportions. The motive of the utilitarian is so obviously unimpeachable; the student of pure science may be, in the words of the Preacher, casting his bread upon the waters whence it may return only after many days. On the one hand is the crying need for active help, on the other is the conviction as to what is the ideal. I do no more than ask you, as citizens of the Empire and as students of science, to reflect upon these matters. Each must follow the dictates of his own conscience—"to thine own self be true; thou canst not then be false to any man."

ABSTRACT OF PAPERS COMMUNICATED TO THE CONGRESS.

Section of Agriculture.

President.—MR. J. MACKENNA, M.A., I.C.S., *Agricultural Adviser to the Government of India and Director of the Pusa Agricultural Research Institute.*

The Agricultural Development of North-West India (Summary).¹

—By ALBERT HOWARD AND GABRIELLE L. C. HOWARD.

I. INTRODUCTION.

The development of the agriculture of North-West India is largely a question of the conquest of an alluvial desert by means of irrigation. There are only two defects to consider as far as the soil itself is concerned—want of organic matter and a tendency towards the accumulation of alkali salts. These shortcomings, however, are small matters compared with the want of moisture.

¹ This paper will be published *in extenso* in the Congress number of the *Agricultural Journal of India*.

That water is the limiting factor in the agricultural production of North-West India is generally recognized. The continuous development of the work of the Irrigation Department is the outward and visible sign that the State is dealing with one of the greatest problems in Indian agriculture in a practical manner. The supply of irrigation water is, however, only the first stage in irrigation. Equally important is the discovery of the best use of this water and how we can extract from each unit its utmost duty. The provision of water is the work of the engineer. The discovery of the best method of using it is the work of the Agricultural Department.

The present position of irrigation in North-West India is this. Government has provided a magnificent system of canals which protect the country from famine and which increase its production. The people, however, do not know how to use this water to advantage and are making all kinds of mistakes in irrigation practice and are doing injury to the country. They have yet to realize the evils which follow from over-watering alluvial soils.

The waste of water is not the only defect in agricultural practice in the North-West. The necessity of increasing the supply of organic matter in desert soils is often lost sight of and insufficient use is made of the nitrogen collecting leguminous crops. The object of this paper is to suggest a means by which the fertility of the soil in this region can be increased and by which the present supplies of irrigation water can be made to go much further.

II. THE PLACE OF LEGUMINOUS CROPS IN DESERT AGRICULTURE.

The obvious method of increasing and maintaining the amount of organic matter in the soil is by means of green-manuring. In desert agriculture this is, however, a counsel of perfection. The problem is to discover a method by which the organic content of these soils can be increased which will, at the same time, prove profitable to the cultivator. It is suggested that the solution will be found in the extended growth of fodder crops like *shaftal*, lucerne, berseem, *senji* and *guir*.

No great extension of these fodder crops is likely unless they can be dried and baled for use as fodder for transport purposes. Besides enriching the land, their extended cultivation will help in the feeding of the work cattle and allow of an improvement of the fodder without the use of grain. The albuminoid ratio of dried lucerne and dried *shaftal* is very high, from 1 : 3 to 1 : 4. Actual feeding trials in the Army at Quetta prove that working animals like horses and mules thrive on comparatively small quantities of such fodder.

With proper precautions, drying and baling fodder like lucerne and *shaftal* present no great difficulties even in the arid climate of Baluchistan. First class produce has been prepared, the use of which is likely to reduce the weight of fodder taken by an Army on active service by 25 to 30 per cent, an obvious military advantage. The trials of baled *shaftal* in 1915 and 1916 in the Army at Quetta have proved so successful that it has been decided to purchase 6,000 mds. in 1917 for full tests by the various units of the Fourth Division. Arrangements have been made to grow and bale this amount near Quetta.

III. THE SAVING OF IRRIGATION WATER.

In order to increase the organic matter in the soil by means of leguminous crops it is evident that a good deal of water will be required. This can be obtained by the application of water-saving methods in the growth of wheat, the most important cereal crop of North-West India.

Since the year 1912, a considerable amount of attention has been paid at Quetta to the discovery, under Indian conditions, of the maximum duty of water when applied to wheat. The details of the work are to be found in Bulletins 4 and 7 of the Fruit Experiment Station,

Quetta. The water now wasted by the zamindars on every 200 acres of irrigated wheat is sufficient to produce grain and straw worth a lakh of rupees. Demonstration work on cultivators' fields has been even more successful than the results obtained at the Experiment Station, and this year the wheat area grown with one irrigation is considerable.

IV. SUMMARY.

The object of this paper is to draw attention to the problems underlying the development of agriculture in North-West India. It is suggested that the question must be regarded simultaneously from two points of view—the enrichment of the soil by the extended growth of nitrogen collecting leguminous plants and the saving of irrigation water.

No great extension of the leguminous fodder crops of this tract is possible unless they can be dried and baled and unless the product can be sold to advantage. To introduce this fodder to the notice of all concerned there must be a steady demand and for this purpose the Army is the most obvious purchaser. On this account the trials of baled *shaftal* by the Quetta garrison were initiated and developed. The tests already made show that by the use of such fodders the weight of forage taken by an Army on active service can be reduced by 25 to 30 per cent, an obvious military advantage. The extended growth of these fodders will enrich the land and will increase the production of crops like wheat. A great opportunity for developing the North-West now presents itself in which the Army authorities and the Government can work together to the mutual advantage of both. In such a matter, the Army will not function as a mere spending Department but as a powerful agent of development in that region of India in which it is mainly concentrated.

Once the Army comes into the market for these dried fodders, their extended use is certain. Anyone who has seen the poor feeding of the thousands of cattle engaged in moving produce over the main trunk roads in the North-West, will at once realize how much these fodders would improve the efficiency and reduce the numbers necessary for the work. In urban areas, both cattle and horses are underfed and overworked. The numerous dairies springing up in the large towns are producing milk inferior both in quantity and quality to that which would be possible if the albuminoid ratio of the fodder could be improved. For famine reserves, these baled fodders would be of the greatest use. Such produce is easily stored for long periods, is readily transported and the quantity is easily checked by merely counting the bales. It is highly nutritious and therefore would be a useful reinforcement to such materials as *bhusa* and dried grass whose function would be the dilution of the leguminous hay.

The water necessary for the extended growth of leguminous fodder crops can be found by the adopting of water-saving methods, such as described in the bulletins of the Fruit Experiment Station at Quetta. In Baluchistan, the water wasted every year on every 200 acres of irrigated wheat would grow grain and *bhusa* worth a lakh of rupees. These methods can be applied to the Punjab, Sind and to the Western Districts of the United Provinces. Their adoption would release a large volume of irrigation water which is not only wasted but which is doing a great amount of harm to the country.

Once these improved methods become general in North-West India, the producing power of the soil is certain to increase. The work-cattle will be better fed and the door will be opened for a more intensive cultivation of the land and for the use of heavier and better implements. The country will, at the same time, support a larger population and with the increased production of the soil the prosperity of the people will rapidly improve. Indian agriculture is at present labouring in a vicious circle. The land does not produce enough to admit of the work-cattle being properly fed. Without more efficient oxen it is difficult to adopt the simplest cultural improvements. Only the surface of the soil is scratched

and only the merest skin of the deep alluvial soils of the plains is made use of by crops. This vicious circle, however, can be broken. Nature in the form of the nitro-gen-fixing leguminous fodder crops provides the means. The resources of the State, properly directed, are amply sufficient to utilize this means.

The Results of some Experiments on Ragi (*Eleusine coracana*).
—By L. COLEMAN and K. B. VENEATA ROW.

This paper deals with the results of cultivation experiments extending over some eight or nine years and plant breeding experiments extending over four years.

Science of Forestry.—By C. E. C. FISCHER.¹

1. Backwardness of forestry in Great Britain owing to her geographical position and climatic conditions.
2. Progress of forestry in Europe.
3. Advocacy of forestry in Great Britain.
4. Position of forestry in India.
5. Indirect benefits of forests.
6. Necessity for further research in India.
7. Natural phenomena on which the science of forestry is based.

¹ A Study of the Arrowing (flowering) in the Sugarcane with special reference to Selfing and Crossing Operations.—By T. S. VENKATARAMAN.

In the work of breeding new sugarcane varieties by raising seedlings, a study of the conditions which lead to the flowering in the sugarcane is naturally one of great importance. Geographical situation, amount of rain received during the period of active growth in the cane, interference with the vegetative growth as resulting from the roots getting pot-bound, and the time of planting combined with the nature of the soil on which the canes are planted, are all found to be factors of some importance in inducing flowering in the cane. It has also been found that, whereas certain classes of canes flower freely year after year, others do not flower at all, or do so but scantily.

Sugarcane varieties show a marked sequence in the time of arrowing and the thick canes, on the whole, arrow earlier than the thin ones. There has been, in the past, a persistent attempt at making the above two classes of canes arrow simultaneously with a view to crossing, as it is believed that in such a cross lie the greatest chances of success at the production of a better class of cane for North India. A certain amount of approximation between the two arrowings has been secured by a careful manipulation of the dates of planting and soil conditions.

A study of the arrows (flowers) of different varieties has shown some interesting differences as regards male fertility between (1) different varieties, (2) Plant *versus* Ratoon crops, (3) different parts of the same arrow, and (4) 'Early' *versus* 'Late' canes. The above study has enabled the separation of a certain group of canes with comparatively poor male fertility to be used as 'Mothers' in crossing operations, and also a selection among the arrows of the same variety as to which to cross and which to self.

A study of female fertility in the cane arrow undertaken with some success for the first time during the arrowing season 1916, promises

¹ This paper will be published *in extenso* in the Congress number of the Agricultural Journal of India.

equally important results, the presence of starch grains inside the cells of the style branches appearing to be an indication of female fertility. It is hoped that the above studies will introduce a certain amount of certainty in future selfing and crossing operations.

Bagging is found to have an inhibitory effect on the seed setting in an arrow, chiefly in the case of the thick canes, and a study of temperature conditions inside and outside the bags shows a higher temperature under the former conditions, occasionally by as much as 10 degrees at midday.

Because of the poor and comparatively slow results obtained in other countries by actual emasculation and cross pollination, this method was found to be unsuited for purposes of the station, which was sanctioned only for 5 years, and new methods had to be evolved.

¹ Study of the Sucrose Variations in successive Cane Joints as they attain maturity, with special reference to the Death of the Leaves.—By T. S. VENKATRAMAN and K. KRISHNAMURTHY RAO.

The main work at the Sugarcane Breeding Station, Coimbatore, is to raise a large number of sugarcane seedlings year after year, grow them to maturity and select the best of these, as regards their botanical, agricultural and chemical characters, for propagation.

The sucrose value of any seedling is ordinarily ascertainable only when the seedling is ripe and is harvested. As this takes sometimes as long as 20 months from the date of germination, an attempt was made to get some earlier indication of it. Besides this, it would save heavy botanical and chemical work on undesirable seedlings to be able to detect the good ones before maturity.

(1) An analysis of that part of an obviously immature cane which bears only dead leaves (analysis up to dead leaf) showed that this part of the cane is, in a certain sense, mature; but the interference of various other factors (such as shooting, lodging, weather conditions) prevented this form of analysis from being fully useful.

By comparing the analyses, however, of the *same cane*, up to the highest dead leaf (Dead leaf analysis) and up to the point where the ryot ordinarily cuts the cane for the mill (Ryots' sample analysis), it was found that, whereas the two figures show very great differences when the canes are immature, they practically coincide at the time of maturity. Here then we have a new method of ascertaining the maturity of a cane.

(2) By cutting the canes into successive pieces from the base upwards, and analysing these separately, a better result was obtained.

- (a) In a very immature cane the highest sucrose content was found in the lowest section.
- (b) As the cane ripens this region of highest sucrose content gradually moves upwards.
- (c) If different canes of the same variety are sectionally analysed on different dates, the highest sucrose contents obtained on those dates are practically identical.
- (d) A cane left growing in the ground after it has attained maturity showed rapid deterioration in the basal joints.

The highest sucrose reading obtained by sectional analyses we have called the 'Sucrose Index' of the cane, and it is claimed that this is fairly constant, and will enable a comparison to be made between different seedlings even when they are immature.

¹ This paper will be published *in extenso* in the Congress number of the Agricultural Journal of India.

¹ The Planting Industries of Southern India.—By R. D.

ANSTEAD.

The Planting Industries of Southern India comprise a number of different products of which Coffee, Tea and Rubber are the main crops, and the paper sketches the early history of these three industries.

The oldest planting industry in Southern India is Coffee. The early history of this product is shrouded in mystery and veiled in legends. Coffee is indigenous to Ethiopia and was probably introduced from there into Abyssynia about 875 A.D., and from there it reached Arabia, Syria, Persia, Turkey and other countries in Asia.

No food product has ever had to face as much opposition as Coffee; religious superstition, political opposition, medical prejudice, fiscal restrictions, taxes and duties, but surviving all these it has become a world popular beverage and food.

Tradition has it that Coffee was introduced into South India by Baba Budin in 1600 on the hills above Chickmagalur in the Mysore State. It was certainly introduced from Aden to the Malabar Coast in 1700 and in 1800 references are found to it in Indian literature. There are now some 200,000 acres under cultivation on the hills from the northern limits of Mysore, through Coorg, the Nilgiris, Shevaroy's, Pulneys, to Cochin and Travancore.

The next biggest planting industry is Tea. The Tea plant is indigenous to Assam and also in China, and its use and cultivation originated in the latter country, the history of its discovery being purely legendary. The cultivation of Tea in India was first recommended in 1834 and the China variety was tried and failed. In 1840 the Assam Tea Co. was started with the Assam indigenous variety and there are now some 64,000 acres under Tea in Southern India chiefly in the hill tracts of the Nilgiris, Wynad, Malabar, Cochin and Travancore.

The latest planting industry of any considerable size to be established was Hevea Rubber. Wickham in 1876 brought home to Kew the first supply of seed of any size and this he smuggled from the Amazon. Plants raised from this seed were sent to Ceylon and in 1879 twenty-eight of these plants were put out at Nilambur. About the same time a number of plants were put out by Ferguson at Poonoor at the foot of the Tammarachery ghaut and 60 of these survive to-day. The trees were neglected and the experiment considered a failure till Proudlock in 1902 reported on the west coast country as being suitable for Rubber cultivation. The first Rubber estate in South India was opened in 1902 at Thattakad on the banks of the Periyar river in Travancore. This was quickly followed by other estates and now there are some 60,000 acres under cultivation, and Rubber which in 1770 was only used to erase pencil marks has become one of the most important and valuable commercial products in the world.

The Planting Industries of Southern India are now so firmly established that it is apt to be forgotten that it is only comparatively recently that they were introduced.

Every year the Planting Districts are developing, the means of transport are improving, the mechanical facilities are extending, and in the rush of development the romance of the early days, the memory of the pioneers and their difficulties, their British pluck and determination, are apt to be crowded out and forgotten.

Agricultural Insurance.—By J. S. CHAKRAVARTI.

The paper discusses whether Indian agriculture satisfies certain conditions which are necessary for making a scheme of agricultural-insurance

¹ This paper will be published *in extenso* in the Congress number of the Agricultural Journal of India.

practicable in India. The following three points are especially dealt with:—

- (a) Under Indian agricultural conditions will a scheme of rain insurance practically serve all the purposes of agricultural insurance?
- (b) Can any periods be marked off in the Indian agricultural year the quantity of rainfall in which by itself will practically determine the success or failure of agriculture for the year?
- (c) What percentage of deficiency in the normal rainfall should be regarded as a minimum limit for insurance purposes?

As regards (a) and (b) the result arrived at is an affirmative answer. As regards (c) it is found that the percentage is different under different conditions but a percentage can be arrived at for every risk-fixing period of the agricultural year in any of the homogeneous agricultural areas.

The detailed investigations of the author on the subject of agricultural insurance in Mysore and the concrete scheme which he has drawn up with reference to that area are also referred to in the paper.

“Some Enzymes of Germinating Red Gram”¹ (*Cajanus Indicus*).—By B. VISVANATH.

The enzymic activities of an aqueous extract of germinated red gram have been investigated and it has been shown that diastase, maltase, sucrase, oxidase, lipase, urease are present together with a rennet-like enzyme.

The main interest, however, attaches to the fact that, although these seeds contain about 23 per cent of reserve proteins, there is no peptase present either in the normal or freshly germinated seed. This enzyme only appears at a much later stage of germination. There is, however, an enzyme present which hydrolyses peptones.

The proteolytic enzymes act best under slightly alkaline conditions while the rest of the enzymes act best when the conditions are slightly acid.

Water Hyacinth (*Eichornia crassipes*) and its Value as a Fertilizer.¹—By R. S. FINLOW.

In recent years the growth of Water Hyacinth has assumed alarming proportions in Bengal, Burma, Indo-China, Australia, Florida, etc. In Burma it has caused such difficulties in the navigation of rivers that special legislation has been resorted to with the object of eradicating it. Different measures are being tried in different countries to remedy the evil. The habit and growth of the plant has been described in this paper. With a view to investigate its agricultural possibilities the author in collaboration with Mr. McLean, Deputy Director of Agriculture, Eastern Bengal, carried out a series of experiments at Dacca in the monsoon of 1916 with jute as a test crop. The results show that up to 94 lb. potash (K₂O) per acre with lime, applied to acid laterite soils in Bengal, produces a remarkable effect on the yield of jute. The same result was produced by equivalent amounts of potash in rotted Hyacinth, Hyacinth ash, carbonate of potash and chloride of potash. In the green state the plant is very bulky. The rotted material is also very bulky, being comparable with Farm-yard manure, except in regard to the potash content

¹ This paper will be published *in extenso* in the Congress number of the Agricultural Journal of India.

which is several times greater. Transport difficulties will, therefore, prevent its use at any great distance from the place of production. The plant can be dried and burnt but, of course, all the organic matter and the nitrogen are lost in the burning. The ash containing 50% of chloride potash in addition to phosphate and lime can be profitably used as a fertilizer. Messrs. Shaw Wallace & Co., of Calcutta, have offered to buy any quantity of Hyacinth ash at Rs. 4 per unit of potash (K_2O) landed in Calcutta. This is equivalent to from Rs. 84 to Rs. 120 per ton of the ash. Further the author mentions that there are already indications that the cultivator has begun to appreciate the agricultural possibilities of Water Hyacinth.

Conditions influencing the Distribution of Potato Blight in India.¹—By J. F. DASTUR.

The author describes the conditions under which the fungus *Phytophthora infestans* was found to occur, and also how it spread all over potato-growing countries from America where it made its first appearance. This fungus was introduced into India from Europe along with the importation of large quantities of seed tubers from infected countries such as England. The potato blight is not well known on the Indian plains, but it is to be found with certainty in Northern India, and that, too, at high altitudes. From the account of the experiments with potato cultivation at Jorhat, Sabour, etc., it seems that at times this blight has also been found on the plains, but the epidemic has always been sporadic and the origin of the disease has been traced to the sowing of diseased seed tubers got from infected sections of tubers after the end of summer.

This discovery precludes the possibility of the fungus establishing itself in the plains and therefore potatoes of excellent quality, though susceptible to the disease in hills, can be grown on the plains without being blighted, provided potato seeds are obtained in summer when the temperature is high enough to kill this fungus.

The Improvement of Cotton Cultivation in the Central Provinces studied from an economic point of view.¹—By D. CLOUSTON.

Early attempts to improve cotton cultivation in the Central Provinces were based on the supposition that improvement in the staple was the chief desideratum, and that this could best be done by introducing long-stapled American and Egyptian varieties and by extending the cultivation of the fine-stapled indigenous variety known as Bani (*G. Indicum*). As the result of the classification of the indigenous cottons and of the work done on cotton by the Department of Agriculture within the last ten years it has been definitely proved that Roseum, one of the six varieties which constitute the Jari mixture of the Provinces, is much superior to all others, in so far as it gives a higher yield of kapas per acre and a higher ginning percentage. The lint of this variety, viz. Roseum, has several good qualities to recommend it. It is clean, its colour is good, and it has "bulk." By growing it the cultivator makes an extra profit of at least Rs. 15 per acre. There is a keen demand for this variety and the Department has, through its Seed Farms and Co-operative Seed Unions, been distributing from 1½ to 2 million pounds of Roseum seed each year for the last three years. The area under this new variety is not less than 700,000 acres. Its introduction has added at least one crore

¹ This paper will be published *in extenso* in the Congress number of the Agricultural Journal of India.

and five lakhs of rupees to the wealth of the Provinces this year which will cover the cost of the Department of Agriculture in the Provinces 20 times over, and the cost of all the Agricultural Departments in India including Burma about twice over.

Much time has been given to the improvement of Roseum and other promising varieties by selection; and it has been definitely proved that Buri (*G. hirsutum*) is immune to cotton wilt—a fungoid disease which does much damage to cotton in parts of the cotton tract.

Of the many crosses produced the Sindewahi cross obtained by crossing Bani with a *neglectum* cotton is of considerable promise. It gives 36 % of lint to seed while Bani gives 26 % only. Its lint is nearly as good as that of Bani.

It has been proved that the ginning percentage of different strains vary and that the percentage can therefore be increased by careful selection from pure line sowings. The offspring of a mother plant giving a high percentage of lint has been found when taken collectively to inherit this same character, though the percentage given by different plants of the same strain varies. The variation in the percentage of lint to seed in the case of a cotton depends on the quality of the soil, on the rainfall and on the time of picking. The first and last pickings give the lowest percentage. Light soil and an insufficient rainfall both affect the ginning percentage adversely.

Cotton in the Central Provinces is grown in an area of about 4½ million acres. The soil of this area is almost all 'black cotton,' a stiff clayey loam which suffers from water-logging during periods of heavy rain. Irrigation of cotton is never practised, and the crop is only grown in Districts where the rainfall does not exceed 45". Experiments carried out on the thin laterite soils of the rice tract have shown that on such soils cotton can with irrigation be grown very successfully with a rainfall of even 60". It would appear, therefore, that on well-drained soils the rainfall is not necessarily the limiting factor in cotton cultivation.

The Phosphate Depletion of the Soils of Bihar; its effect on the Quality and Yield of Crops of the contingent risks of Malnutrition and Endemic Disease in Cattle and Man.¹—

By W. A. DAVIS.

Section of Physics and Mathematics.

President—The REV. D. MACKICHAN, D.D., LL.D., *Principal and Professor of Physics, Wilson College, Bombay.*

Presidential Address.

In opening the sessions of the Physical and Mathematical Section of this Congress I have elected to address you on the history of the development of the scientific spirit in India rather than to follow the usual course of passing in review before you some of the more recent developments in the department of physical research. With these you are, most of you, already familiar or have the means of making yourselves acquainted. I possess no special title to instruct you concerning them; I am more concerned to keep before you the possibilities that exist in India for the growth of an Indian School of Research as judged by the past history of Indian thought in the department of the studies represented in this Section of the Congress and the present attitude of the mind of India towards them.

¹ This paper will be published *in extenso* in the Congress number of the Agricultural Journal of India.

The advancement of Science in any country depends not simply on the gifts of individual genius but on the surrounding environment, and both these factors are in their turn largely affected by a nation's traditions and history. This environment has received the form which it presents to-day to a large extent through the influence of Western education which has re-awakened the scientific activities of India, which had long lain dormant, into something of their ancient liveliness and vigour. This Congress is itself a witness to this re-awakening and the Institute of Science which has drawn us to this centre is a concrete exhibition of the resolve of India to enter upon its rightful inheritance. The number of Indian workers in the field of Science who are participating in this Congress proclaims the fact of a Science Renaissance in India.

My own memory goes back to the time of its first real beginnings. When I first came to India, the higher education of this country was largely confined to literary channels, and Science, apart from its relation to certain professional courses of study, had a very insignificant place in the system of higher general education. Pure Science as recognized in our Indian Universities was, to a large extent, a merely theoretical study, acquainting men, no doubt, with the results achieved by experimental research in other lands, but having no definite purpose of training the youth of India in the processes by which these results were reached or of inviting them to enter by similar methods into the same quest. But the generation that has just ended has witnessed enormous changes. Just as in England the period preceding that generation had seen a general revival of the modern scientific spirit and a large infusion of it into the higher education of the country, India receiving something of the same afflatus began later to enter on the same path. Some of the best minds in our Universities began to be attracted into special lines of science study and the really great Indian names which have won distinction in these new fields are those of men whose student career began when this new movement established itself. The eminence which they have attained is a sufficient proof of the aptitude of the Indian mind for such studies. In addition to these, whom we may call specialists, the large number of able students, who have chosen this line of study as part of their general education, are gradually building up an environment composed of men possessed of scientific knowledge and trained to appreciate the value of scientific pursuits. From my own experience of Indian students, I have received the impression that speaking generally the students who select such studies as part of their course are the most thoroughly trained and frequently the ablest men of their respective years.

When we reflect that this Science Renaissance in Europe, so far as methods of education are concerned, is not much more than half a century old, we have reason to be filled with hope in view of the marked advance in this direction which has been witnessed in India in the course of the last thirty years. What is true in regard to England in the matter of University studies is true also of other foreign Universities. The "Physikalisches Institut" of Germany is a comparatively modern development. I remember visiting the Laboratory of the great Helmholtz in Berlin University in the early seventies and finding there only a very modest collection of apparatus not larger than can be seen to-day in any well-equipped College in India. As in England, so there also there were great individual workers; but the education of the community had not yet been penetrated by the new spirit. Lord Kelvin was then at the zenith of his fame; but he, too, was content with a limited laboratory (containing, however, some splendid instruments of precision, the products of his own genius) in no way adapted for the accommodation of a large body of students, able to receive only about half-a-dozen men who conducted researches under his inspiring leadership. Of science-teaching in the proper sense as a University discipline there was little thought in these days. All this has been changed and now here in India almost every stage of education is made to include some kind of training in

experimental work. To-day throughout the Bombay Presidency so great is the emphasis that is being laid on this side of education, so revolutionary has been the change that many institutions are still only struggling towards a compliance with the new demand.

In order to grasp the full significance of these movements let us glance back at the past of India and note the lines along which the mind of India found its development. Let us bring a truly scientific spirit to this inquiry, a spirit which demands the acceptance of well-established facts and not a blind enthusiasm for antiquity. We are not unaware of the existence of persons who sincerely believe and solemnly affirm that there is no modern scientific truth that was not familiar to the writers of the most ancient Hindu Scriptures, who find in the Vedas the steam-engine, the locomotive, knowledge of electricity and even the aeroplane. We may well marvel at the lack of imagination and the ignorance of the most elementary canons of literary criticism that renders such credulity possible. There are those again, persons of an entirely different grade of intelligence who claim for the ancient scientific writers of their country the credit of having anticipated by several centuries the greatest discoveries of more modern times. There is really no need for such an excess of national piety towards a people whose intellectual history is surely rich enough to enable it to dispense with any false accretions.

In studying the progress of scientific knowledge in this ancient land one is struck by the fact that the only sciences within the proper domain of Physics that bulk largely in this ancient history are those of Astronomy and Mathematics, its indispensable handmaid. In this respect India's case is not essentially different from that of all the old nations at a corresponding period in their development.

In India the impulse to the cultivation of the Science of Astronomy came from three sources:—(1) the impression which is made upon the human imagination by the splendid majesty of the heavens and the desire that is thus awakened to understand something of the laws which govern their silent movements, (2) the necessity of a calendar of times and seasons to regulate the performance of religious observances, (3) the function which astronomy performs as a basis for systematic astrology. The extent to which these scientific inquiries were fostered by religion has probably been greater in India than in any other country. In India the influence of religion has made itself felt in every department of man's life and even the scientific writer of ancient India regarded their theories and their rules as divinely revealed. In the opening verses of the *Sūrya Siddhānta* the Sun propitiated as a deity is represented as saying: "I am gratified by thine austerities. I will give thee the science on which time is founded, the grand system of the planets." Mathematical treatises like the *Siddhānta Shiromani*, the *Lilāvati* of Bhāskarachārya begin, as indeed do all Sanskrit writings, with an invocation to the gods. One cannot but respect the religious feeling which prompts such invocations; but at the same time one cannot forget that the idea that Scripture contains a revelation of scientific truth has proved both in the East and in the West a hindrance to the progress of science.

I. The earliest period of Indian thought, of which we have written records, is represented by the *Veda Samhitas* and the *Brāhmanas* attached to them, a period that we may safely regard as free from Greek and other foreign influence. A great portion of this literature is concerned with the mythological interpretation of nature and its phenomena, a feature which is not entirely absent even from some of the systematic treatises on astronomy of a later age. But there is also a non-mythological element in this old-world view of things. It calls attention to the presence of law and regularity in recurring phenomena of nature, the path of the dawn, the motions of the sun and the moon. We find the beginnings of reflection on these phenomena in the naive wonder so often expressed that the sun though unsupported does not fall down from the heavens. Only two heavenly bodies are mentioned, but it is scarcely probable that the

brighter planets, Venus and Jupiter, could have escaped notice. But that the knowledge of this early period extended to the five planets, there is no evidence. To this age, the year was one of 360 days, *i.e.* 12 months each containing 30 days. Such a reckoning of time, if uncorrected, would inevitably have wrought confusion among the seasons. That this was corrected by some kind of intercalation seems to be suggested by a passage in the Rig-Veda which runs thus: "Varuna knows the month that is born in addition to the twelve." The movement of the sun towards the North is said to last 180 days, and the movement to the South an equal number of days. To bring this into harmony with actual experience, the Sāma Veda states that from time to time the *Ayana* or movement to the North lasts 189 days. This is not science; it is a crude conjecture intended to adjust the solar and lunar reckonings to each other.

To this age belongs also the conception of a zodiac consisting of 27, sometimes 28, constellations known as *nakshatras*. A feature of special interest in this connection is the point from which these *nakshatras* are reckoned. This enables a conclusion to be drawn as to the period to which the list belongs. The most reliable conclusion is that which fixes it in the 12th century B.C.

II. It was only at a much later stage that anything like an astronomical system was formulated, *viz.* in the Sutra period of Brahmanic literature, the age of the Maha'bharat, the Purānas and the Buddhist writings. This period was also free from external influences and the system which belongs to it was purely Indian and national. The Surya Prajñāpti (a Jain work) and the Jyotisha Vedānga are typical treatises of this age. The latter is an astronomical hand-book in metre and so concisely expressed that much of it is obscure and difficult of interpretation. According to this system the earth's surface is a huge circular plane in the centre of which stands a mountain of enormous height named Meru on which the gods dwell. This disc consists of successive rings of dry land separated from each other by seas which are also circular in form, the ocean, the seas known as the salt water ocean, the ocean of sugarcane juice, ghi, etc. The inner *dripta* or continent adjoining Mount Meru has Bhāratvarsha as its southern portion. The heavenly bodies circle as gods in their chariots around the mountain in a plane parallel to the disc of the earth. Sunrise and sunset take place when the sun passes out of and enters the shadow cast by the great central mountain. The Jains assume that the heavenly bodies accomplish only one half of their circuit in 24 hours, and are under the necessity of assuming the existence of two suns and of similarly duplicating all the heavenly bodies. It is unnecessary to detail all the shifts to which these early astronomers had recourse in order to explain other important features in the movements of the heavenly bodies. These are all justly ridiculed in the Surya Siddhānta which marks the real beginning of a scientific attempt to explain the phenomena of the heavens.

The complicated and clumsy system which I have briefly sketched with all its elaborate calculations held the field for centuries. Its year of 366 days was inaccurate enough; but that the five years' cycle should have continued in its crude and uncorrected form for centuries and that this system should have been followed over wide areas of the country is sufficient to show that the scientific spirit, which demands a higher standard of accuracy both of observation and calculation, was not yet awake in India. A new stimulus was needed to promote this awakening.

III. That stimulus came, as we shall see from India's contact with Greece. The really scientific period began probably about the fifth century, of our era, at least not earlier than the third century. It extended over several centuries down to the twelfth in which it received its fullest exposition in the writings of the greatest of India's mathematicians. The Surya Siddhānta which was probably the culmination of previous effort to systematize Indian astronomy belongs to some period between

the above limits, and contains the system which has been followed ever since down to the present day.

The system preserves some characteristic Indian features. The period of the revolutions of the heavenly bodies is not defined by numbers of days but is fixed with reference to the Maháyuga or cycle of 4,320,000 years. The number of revolutions completed in this period fixes the duration of each revolution. The sun, the moon, Mars, Jupiter and Saturn are dealt with in this fashion. For Mercury and Venus the procedure and its explanation are different. Their mean positions (this in agreement with the system of the Greeks) are given as the mean positions of the sun; their actual positions, now to the East and now to the West of the sun are explained as due to the action of unseen beings designated "forms of time" which pass through the zodiac and continually draw the planets to them by cords of air. These disturbing beings make the same number of circuits in a *yuga* as Mercury and Venus.

In this system the use of the *maháyuga* and the still greater *kalpa*, which are out of all proportion to the periods required in astronomical observation, shows the strong influence of religion on the scientific methods of India. So dominant was this influence that one of the Siddhántas was excluded from the Smṛiti simply because it made no use of these periods which enjoyed a religious sanction. This method of periods was essentially unscientific. Instead of measuring the periods as multiples of the year, the year became a submultiple of a particular period and the accuracy of the determination of these smaller periods was sacrificed in the interests of the *maháyuga* into which a definite number of them must be fitted.

The mythological device employed to explain the libration of the nodes of the moon and the apparent inequality in the motions of certain planets is another illustration of the same characteristic.

The question as to the dependence of this system on the teachings of the Greek astronomers is one of long standing. It is natural that India should desire to establish its independence of foreign influence in the development of its astronomical system. The weight of evidence seems to be, however, in favour of the conclusion that the essential features of the new system owe their origin to that contact with Greece which established itself in commerce in the early centuries of our era. The new and scientifically constructed system which is found in the Surya Siddhánta and which has remained practically unmodified ever since, is so identical with that of Ptolemy's Syntaxis that it is difficult to imagine that the two systems had an independent origin. Setting aside peculiarities in the mode of explaining certain phenomena, features that are characteristically Indian, there remains an identity of astronomical method so complete that anyone following the rules of the Indian Siddhánta is bound to arrive at practically the same results as he would have reached by employing the formulæ of the Ptolemaic astronomy. It is no argument against the identity of the origin of the two systems to point to differences in some of the determinations given in each. This discrepancy in some minor details is easily intelligible and cannot set aside a conclusion based on complete and minute agreement in regard to fundamental conceptions. It is true that Aryabhata, whose date cannot be fixed earlier than the third century nor later than the fifth, asserts the doctrine of the rotation of the earth on its own axis as a sufficient explanation of the apparent movements of the heavenly bodies. One can imagine such a single conception arising independently in different minds and it is found also among the predecessors of Ptolemy among the Greeks; but in Greece as in India this fruitful conception fell on unresponsive soil. It was first controverted and then ignored. Only after the lapse of centuries did it succeed in gaining, in the face of enormous opposition, the place which it now permanently holds. It is not, however, possible to accept such mutual independence in the case of two complete elaborate systems both resting on the peculiar theory of epicyclic

movement, both containing similar technical terms and astronomical names. The Greek "kentron" is undoubtedly the origin of the Indian *kendra* and the greek zodiacal names were known to the Indian writers, also the Greek names of the planets.

As to the question of priority as between the two systems, there is every reason to consider that the Greek system was prior to the Indian in time. This however is a less convincing argument because of the uncertainty which always attaches to such early chronology than the fact that the Greek system was the result of a development which can be traced in successive stages of thought during preceding eras, whereas the Indian system stand out in complete isolation from all that preceded it. There is an absolute gulf between the Siddhānta system in its earliest form and the Puranic doctrine already alluded to, which cannot be bridged. A new influence must be assumed to account for a change so abrupt, for which there was no preparation in the eras which went before.

To my mind this is a consideration which ought to outweigh every other form of argument in leading us to conclude that the Indian system was an offshoot from that of the Greeks.

The system thus formulated has undergone practically no development since the time of its adoption.

But if India has to renounce her claim to be the discoverer of this system, she deserves a renown of really higher value because of the brilliant names which adorn this period. The names of Aryabhata, Varāha, Mihira, Brahmagupta and Bhāskarachārya, to mention only the best known, add a great lustre to this age of Indian research. Greece had developed a mathematical system of wonderful perfection in the domain of geometry. On this was built up her astronomical theory. In India mathematics played a different part. It did not serve as the foundation of the theory but as the instrument of calculation in the practical application of the system, in the solution of problems which were likely to arise. Hence its methods are analytical, embracing a scheme of algebra and trigonometry which marks a great advance in mathematical attainment. Here India can make good her claim to originality. In respect of both arithmetic and algebra India has been the world's teacher. Algebra, although it bears an Arab name, was borrowed from the Indians by the Arabians and our numeral system is not Arabic but Indian.

The representation of the value of numbers according to their position in a decimal scale, the solution of quadratic and bi-quadratic equations and more particularly the solution of indeterminate equations of the first and the second degree, these are a few of the characteristic contributions of India to algebraic progress. The *kuttaka* method for dealing with these indeterminate equations has been described by a great mathematical historian as "the finest mathematical achievement before the time of LaGrange" who, centuries later, re-discovered the method which had long been familiar to the Hindu mathematicians.

India has the credit of having based its trigonometry on the *Sine* instead of the *Chord*, a change which has greatly contributed to the progress of this branch of mathematics.

Aryabhata used 3.1416 as the value of π , a very accurate expression, nevertheless some of his successors with a characteristically Indian love for forms of a symmetrical or symbolical character frequently employed $\sqrt{10}$ as the value of this ratio, a much less accurate expression than $\frac{22}{7}$ or 3.1416, values employed by earlier writers. These Hindu mathematicians came very near to the infinitesimal calculus; yet one of the greatest of them stumbled into error in calculating the volume of the pyramid and the sphere.

One may feel disposed here to ask these two questions:—Why did geometry prove so attractive to the Greek mathematician and algebra to the Indian? and Why did Greece pursue its mathematics to such a wonderful degree of completeness, while India even when on the threshold of great developments stopped short and never advanced any further on

purely Indian lines? I believe that the answer to these two questions is to be found in the speculative character of the Greek mind on the one hand and the eminently practical character of the Indian mind on the other. To the Greek, mathematics was a field of mental exercise cultivated mainly in order to satisfy the craving for the ideal that was a characteristic feature of the Greek mind. Geometry was not pursued in the first instance for any definite practical purpose, chiefly as a study of ideal relations, a department of ideal truth. On the other hand the Indian cultivation of algebra was stimulated by the necessities of his practical life. Astronomy was essential for the exact performance of his religious duties and for astronomical calculations algebra and trigonometry were the necessary instruments. These instruments he furnished and kept in readiness for the operations that were necessary, and this to a degree of perfection elsewhere unknown at that ancient time; but beyond this the science had little further interest for him and its development stopped short when the necessary purpose had been accomplished. What led the Indian mathematician to busy himself with the solution of the indeterminate equation? The answer is that there was an astronomical, and ultimately astrological, necessity for it in connection with certain inverse problems that arose out of the calendar.

Now many have been in the habit of regarding the Indian as so intensely speculative as to be in danger of missing the practical in life and action. It would rather seem to be true that the bent of the Indian mind is towards the practical and not towards the merely speculative. I have sometimes wondered whether we may not discern even in the strictly philosophic efforts of the thought of India something of the same practical purpose which runs through its mathematical achievements. Indian philosophy was no mere speculative exercise, it was not pursued simply to satisfy an intellectual craving; it was something pursued with a view to the practical ends of the religious life. No doubt it demanded an intellectual effort of a high order and employed in its service intellects as great as any which have grappled with the great problems of existence; but emancipation from a condition from which the soul strove to free itself was the goal of all this high speculative endeavour. Perhaps we may discern in this also the reason why India's speculative efforts in philosophy, like her achievements in mathematics, came to a standstill and succeeding generations were content simply to attach themselves to one or other of the leading schools, once they were satisfied that they had found in it the practical satisfaction that their religious instincts seemed to demand. I merely suggest this as a possible explanation of facts peculiar to the history of the development of Indian thought and in opposition to the generally accepted view that the Indian mind is so wedded to the speculative that it is less fitted to devote itself to the tasks of severe science.

From the rapid survey I have attempted it appears then that India like the rest of the world was in the ancient time still far from the paths of the modern scientific method. Even its later efforts were confined to the reduction into an ordered system of the manifold phenomena which pressed themselves on their attention; the external framework, not the inner connections of the phenomena, was that which occupied their thinking. The dynamical foundations of their favourite science remained beyond their ken and were not reached by them or any other peoples until the modern age represented by a Kepler and a Newton. I have seen it stated that Bhāskarachārya had foreglimpses of the law of universal gravitation; but this statement rests on a misapprehension of the real significance of that law. Let me simply quote the statements on which this claim on his behalf has been made.

They are mainly these: "The earth stands firm by its own power without support in space. As heat is in the sun, coldness in the moon, so immobility is in the earth by nature."

"The earth possessing an attractive force draws towards itself any

heavy substance situated in the surrounding atmosphere, and that substance appears as if it fell. But whither can the earth fall in ethereal space which is equal and alike on every side ?”

It may be admitted that the idea of attraction is a step in advance of those who see bodies fall without attempting to inquire why they fall, but we are still far from anything like an anticipation of the great generalization of Newton, a generalization which was based on a theory of attraction which had been verified by elaborate calculation and which gave the key to the explanation of all the heavenly movements. Let every credit be given to Aryabhatta and to Bhāskarachārya, great mathematicians both; but let us not transplant them into a world of ideas that had not yet dawned on the thought of the men of any land. I have been endeavouring to show that Indian science in all its ancient stages was dominated by a specific practical religious purpose and was hampered in its freedom by certain traditional conceptions which had acquired a religious sanction. The stage of the free independent study of nature had not yet been reached. Nor was there a scientific effort after ideal exactness. One of India's great astronomers, Bhāskarachārya, defends his predecessor Brahmagupta from the charge of having refused to admit a periodic motion of the equinoxes. He says that the inconsiderable quantity of the procession which was not marked in his time was the reason why he omitted it from his system; but that, now that it had become sensible in amount, it is taken into account. This plea for inaccuracy is most remarkable. It confirms the view I have stated, that to the mind of India what was sufficient for practical purposes was sufficient also for scientific statement. This is one of the inherited tendencies which we sometimes meet with in the students of to-day. Ideal exactitude has not the place it ought to have in our investigations. We are too much disposed to be satisfied with what will sufficiently serve a particular purpose.

What we should aim at in view of the widening field of Indian scientific inquiry is that sense of absolute freedom which is the vital air of the physical investigator and that exactness of observation and inference which is its necessary complement. It is a hopeful sign of progress that our Indian students of science are beginning to enter into and enjoy this atmosphere and that new ideas of accuracy are being eagerly assimilated.

Nor is there any room for national presuppositions or predilections in this field of study. It is a field in which national distinctions are absolutely unknown. There is no commonwealth so comprehensive as that of science, none in which the brotherhood of men and their share in a common inheritance is so completely realized. The facts with which we deal are the common possession of us all, and the laws which we seek to unfold stand to all of us in exactly the same relation, and success in their unfolding ministers to all of us the same mental satisfaction, the same intellectual joy.

On the beneficent influence which the development of scientific research is bound to exercise on the education and the life of the people of India it is not necessary now to dwell. Suffice it simply to say that amongst these benefits must be included a new reverence for truth and for Him whose thoughts are being continually revealed to us in their overwhelming majesty and power. This new movement of thought laying hold of the practical tendencies of the Indian mind is destined to call forth its ingenuity and resource in dealing with the many practical problems which will continually emerge as India moves forward to higher developments. And as in its past history the mind of India received a decisive impulse from its contact with the science of Greece through the accident of commercial relationship, may we not expect a new intellectual movement still more conspicuous and more fruitful from India's closer contact, in its intellectual life and in its imperial destinies, with that other nation of the West with which in the providence of God it is now linked in an indissoluble union.

On the Theory of the Periodic and Cyclical Vibrations of
Bowed Strings.—*By C. V. RAMAN.*

The author has found that, in a considerable variety of cases, the motion of a bowed string instead of being periodic, becomes cyclical in character. Some photographic records illustrating this fact will be shown as lantern-slides, and the theory of these cases will be discussed in the light of the corresponding theory for the periodic forms of vibration.

On Discontinuous Wave-Motion.—*By C. V. RAMAN and
ASHUTOSH DEY.*

Continuing the investigations described in the *Phil. Mag.* for Jan. '16 jointly by C. V. Raman and S. Appaswami Aiyar, it has been found possible by the authors to obtain, experimentally, wave forms containing two equal or unequal discontinuities, of the same sign or opposite signs, in each period. The resulting vibration forms are found to be of considerable interest in acoustics.

The Cause of the Abnormal Displacements in the Sun's
Spectrum.—*By T. ROYDS.*

Difference of vapour density in the sun and arc has been suggested to account for the abnormal displacement of certain lines in the sun's spectrum, and though no objections have been raised against this hypothesis, attempts at direct experimental proof have failed.

Types of Electric Discharge.—*By D. N. MALLIK and A. B.
DAS.*

In this paper, the authors use vacuum tubes of ordinary pattern (electrodes consisting of thin rods of aluminum) and show, that the discharge passes through the various stages previously obtained with a De La Rive tube, 'showery,' 'band,' and 'glow,' so far confirming the theory worked out in their former papers on the subject. In accordance with that theory it is during the second stage that the discharge should behave like a flexible wire carrying current. This is verified by experiment. When the discharge is striatory, the effect of the magnetic field due to a rectangular coil of wire with two of its sides parallel to the electrodes and carrying current has been studied. This is likely to lead to a theory of striatory discharge, on which the authors are now engaged. The effect of the length of a discharge tube on the change in the types of discharge is most marked. But anything like a complete explanation of it is impracticable at present.

The Cathode fall from different metallic Cathodes.—*By H. E.
WATSON and C. R. PARANJAPÉ.*

This work, a preliminary account of which was given at the last Science Congress, has been continued. A large number of detailed observations have been made with regard to the conditions under which the cathode fall is the same as the total potential across the tube.

The cathode fall has been measured in different gases for about 25 metals, and it has been found that for most of these it is almost constant within the limit of experimental error. A few metals, however, are abnormal, and these are separately discussed.

Interference Fringes formed by a grating.—By C. K. VENKATA ROW.

A system of interference bands was observed extending throughout the spectrum when using a celluloid copy of a Rowland grating mounted on glass as a reflexion grating, the light being incident on the grating face first. The theory of these bands is worked out and experiments given in confirmation thereof.

On the Interference Pattern of thin films at nearly critical incidence.—By E. P. METCALFE and B. VENKATESACHAR.

A somewhat convergent beam of monochromatic light is made to fall on to a plane parallel air film enclosed between two glass plates immersed in water at and near to the critical angle of incidence. The interference pattern so formed is viewed in a telescope focussed for parallel light and is found to consist of nearly straight parallel fringes of varying thinness. This is shown to be due to the rapid variation in the reflecting power of the air-glass surface in the neighbourhood of the critical incidence. The fringes have been photographed with light polarised in the two principal directions. The theoretical intensity curves have been drawn and have been found to agree with the photographs. A new set of interference fringes is observed when the reflecting system is placed between crossed Nicol prisms. These fringes have also been photographed and are accounted for theoretically.

A Note on the Efficiency of the Aeroplane Propellers: Meaning, Measures and Tests, with an Outline of a new Method of Procedure.—By S. S. NEHRU.

The following is a section-wise abstract of the above paper which is a corollary to a technical paper, that has been submitted for publication in Europe.

Section 1. Introductory and explanatory. The disturbed motion in the medium set up by the propeller is only a specific case of the turbulent motion of fluids, which is the province of the physicist, and not of the technician. In considering and measuring turbulence, the root-problem of aerodynamics, an abrupt departure is made from the classical methods of the air-laboratory, and the study of the efficiency of the propeller is placed on a scientific basis.

Section 2. The propeller, function, redefinition, best types. The propeller is re-defined as a transformer, converting rotative into propulsive horse-power. Leading types are considered from the standpoint of efficiency:—(a) the Ratmanoff, subject of tests in England, (b) the Chauvière, the commonest in use, (c) the Bigourdan, a "circular wing," the efficiency of which in the laboratory is four times that of (d) the Gutheburg, the best German Type.

Section 3. Considerations of efficiency, anomalies. A series of anomalies are presented. Thus, the above types are fundamentally unlike, and they are all supposed to possess the same high order of efficiency; classical methods, as shown by the technical reports of the British Advisory Committee for Aeronautics, suppress turbulence, which is precisely the main characteristic of fluid motion; anomalies in the results reached in those reports are explained; so also the anomaly of a propeller, efficiency 80%, converting 50 HP into only HP 20; etc.

Section 4. Criticism of current conception of efficiency, and methods of procedure. It is shown how the current conception of efficiency is responsible for the above, and other anomalies; and the imperfections of the classical method which measures the mere mechanical pull, in con-

finned space, of the artificially and arbitrarily mounted propeller, by the pull-balance, are fully set forth.

Section 5. A complete conception of efficiency should allow full weight to all the multiple factors of natural aspiration.

Section 6. Factors affecting efficiency are fixed under the categories of—space-elements, force-elements, time-elements, from the point of view of the space-distribution of thrusts, at any time, in the medium agitated by the propeller.

Section 7. Effect of the preceding factors on efficiency are fully analysed. Leading up to—

Section 8. The fundamental test of efficiency, which covers two points:—(1) Is the thrust-system, in the natural space, maximum? (2) Does it grow in the minimum time?

Section 9. The measure of efficiency. The space-map is defined. The construction of the space-map is explained. The measure is discussed; and the apparatus, which was actually used with good results, communicated. The gauge, which is the novel feature of the apparatus, and which permits of the actual measurement of the turbulent motion, is described. The working of the gauge is shown step-wise.

Lastly the action of the gauge is placed on a theoretically rigorous footing, by basing it on the mathematical theory of an oscillating fluid column and the attractive or repulsive force between spheres immersed in it and placed close together, such oscillatory fluid-motion being the type of turbulent-flow in the medium in which the propeller is at work.

To conclude, the method records flow-effects just as they occur, just where they occur.

The Duration of School Life, a New Measure of Instruction and a Test of Educational Administration.—*By R. LITTLE-HAILES.*

The method of calculating the duration of school life adopted by the Government of India is criticised and shown to be imperfect. Three other methods of calculating it are proposed and discussed. From the value of the duration of school life thus calculated and from the number of pupils under instruction at any time, a new measure of instruction is proposed. From a comparison of the rate of variation of this new measure of instruction with the rate of variation in the number of pupils under instruction, it is proposed to test the efficiency of the Educational Rules or administration in force at the time of the comparison. The variation in the cost of a unit of instruction is also referred to. Statistics from the year 1895 up to date, *i.e.* for twenty years, are analysed.

On certain Integral Functions defined by a Taylor's Series with extensions to the case of the $n - pb$ Power Series.—
By K. B. MADHAVA.

Section of Chemistry.

President—DR. J. L. SIMONSEN, *F.I.C.*, *Professor of Chemistry, Presidency College, Madras.*

Presidential Address.

GENTLEMEN,

I wish in the first place to say how very greatly I appreciate the honour of being asked to preside over your deliberations at this meeting. My two predecessors in this chair set a most excellent precedent in not delivering a Presidential Address, and it is only after much consideration

that I have decided to break away from this precedent. I do so for the following reasons. Science—the Cinderella of Education—appears at last to be coming into her own, and it behoves us as chemists in India to show that we are prepared worthily to uphold the dignity of our Science.

I do not think that we can say that all is well with chemistry in India, rather would I say that very much is bad. It is only a short seven years since I came to India and I feel some diffidence in criticising the present conditions in the presence of such veterans as my friend Dr. Ray, but perhaps being fresher to the country I may more clearly see the needs and failings if I may not quite so well appreciate the difficulties.

When I first came out, the University of Madras was still slumbering under the old régime, although new courses of study had been arranged and were shortly to be introduced. For the old degree all that was required of a chemistry student was that he should be able to analyse a mixture, the use of the balance was apparently considered to be too difficult and yet his theoretical knowledge, according to the syllabus, would not have disgraced an Honours student. Even for the higher degree, the M.A. in chemistry, practical, physical, or organic chemistry were unheard of. Although unfortunately we still suffer from the after-effects all this is altered now and in our Honours courses, I may say, I think without undue exaggeration, that the training given to the student in chemistry does not fall below the standard of that given in the majority of Western Universities. The Pass degree, too, if it is improved in the manner now proposed, will be quite satisfactory. We see then that there has been progress, and rapid progress too: but yet I say that chemistry, not only in this Presidency but in India in general, is not in a satisfactory state. When we consider the number of first and second grade colleges, the number of men engaged in teaching the subject, we cannot but be amazed at the very small amount of original work which is being done. Let it be understood that I am referring solely to educational institutions and not to special research laboratories such as we have at Pusa, Coimbatore and Bangalore.

As Secretary of this Congress since its commencement I have had a unique opportunity of judging of the number of those who are doing research in chemistry in India, and I am astonished at their fewness. Only in Bengal does there appear to be more than one college in the University in which research is done. It might perhaps be desirable for us to examine into the cause of this and see how it can be altered, because I feel that until there is a healthy research atmosphere in all the Universities and University colleges, we shall see no real advance in the position of chemistry in India.

I would submit, for your consideration, what I consider to be the four main causes of this paucity of research: (i) that in many colleges the staff are insufficiently trained. I do not intend to throw any aspersions on a hardworking, worthy body of men; it was not their fault that when at college they received a training which did not fit them for higher teaching or research, and for the reasons which I shall mention in a moment they have had no subsequent opportunity to improve their knowledge; (ii) that the majority of colleges are very much understaffed. This, in my opinion, is the most serious defect and the main cause of the present state of affairs; (iii) the low rate of pay in academic posts; (iv) the present method of promotion by seniority and not by merit.

Of the other causes to which the lack of research has from time to time been ascribed, I may perhaps mention two, namely want of library facilities and want of a scientific atmosphere. I cannot bring myself to believe that these are really serious factors.

It is always a somewhat delicate matter to discuss the question of the pay offered in the various collegiate appointments. It appears to me, however, that unless the scale of pay is improved it will be impossible for us to attract the best intellects. It is not that I consider the rate of pay

at which the lecturers and demonstrators commence, to be inadequate—it compares favourably with that offered in other countries—but rather it is the future prospects which are so poor. In many cases the lecturer can, under no circumstances, hope to get more than Rs. 150 and that only after many years of arduous service. Now I do not think that anybody can consider this to be an inducement for a clever student to enter upon an academic career, and the obvious result will be, therefore, that instead of there being any improvement in the staffs of colleges, they will more and more tend to deteriorate as other openings arise from the increase of the development of the natural resources of the country.

The tendency for the teaching and research to deteriorate is further enhanced by the fact that in practically all cases promotion is made by seniority and not by merit. I am quite willing to admit that in the larger services, such as the various Government educational services, it will be a matter of considerable difficulty to make any change in the system, but I really cannot imagine that it is beyond the wit of man to devise some more satisfactory scheme than the present. One can but too well understand the feelings of a brilliant young investigator, when he sees a colleague promoted to a higher post, who has done nothing to render himself worthy of it beyond putting in a certain number of years of service. This system must be radically altered if we are to see research really develop.

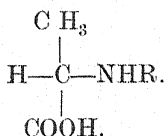
I have thought it of interest to look into the matter of the staffing of the various colleges teaching chemistry up to the degree standard and I find that in many colleges, not only in this Presidency of Madras, but also elsewhere, it is considered sufficient to have one lecturer in chemistry to look after not only large Intermediate classes but also the B.A. (or B.Sc.) classes. He is perhaps assisted by a demonstrator without any previous teaching experience who is very often of little help. Not only is this the case, but in some colleges a lecturer is expected to teach both chemistry and physics. So long as this continues we cannot hope to see any improvement. On a recent occasion I pleaded elsewhere for an increased staff in a college which was to be affiliated in chemistry, and I was told that in view of the fact that other colleges had no larger a staff, the management saw no reason why the staff should be increased. In this case it was not a question of finance, money was available, laboratories were in process of construction, but the authorities, apparently, although they were not men of science, considered that they knew better than their scientific advisers.

Gentlemen, I have dealt with this question of the staffs of colleges at some length because I feel it to be of vital importance. We have to meet in this country the same opposition as has to be met in England. The heads of colleges, the managers of schools, in short the authorities in charge of education have, as a rule, little or no appreciation of the importance of science or of its requirements. It is perhaps too late in the day for us to educate them but we must make sure that the rising generation is not similarly steeped in ignorance. We must insist that our science shall be given a fair chance and that our teachers shall not be sweated—I use this strong word with intent—but that they shall be given opportunity for original work. For I very strongly hold the view that no man can remain a first class teacher or inspire his students who is not actively engaged in research.

Gentlemen, the future is in our hands. Let us prove ourselves worthy.

**The Stereochemistry of Alanine Derivatives.—By C. S. GIBSON
and J. L. SIMONSEN.**

The authors have for a considerable time been engaged on the stereochemical study of compounds of the type:—



Where R is an acyl group.

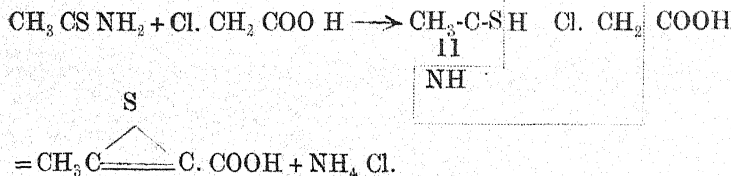
The objects of the research were discussed and a brief account was given of the results so far obtained and the conclusions that may be drawn therefrom.

The Nitration of Isomeric Acetylamino Methoxy Benzoic Acids.—By J. L. SIMONSEN and M. GOPALA RAY.

The authors have investigated the products formed on the nitration of the four isomeric acids, 3-acetylamino-2-methoxy benzoic acid, 5-acetylamino-2-methoxy benzoic acid, 4-acetylamino-3-methoxy benzoic acid, and 3-acetylamino-4-methoxy benzoic acid. They discussed the bearing of the results obtained on the general problem of substitution in the benzene nucleus.

Synthesis of a Derivative of the lowermost Homologue of Thiophen.—By P. C. RAY and M. L. DEY.

By the intraction of thioacetamide and monochloroacetic acid a crystalline compound is formed which is found to be methyl-carboxyl ethine sulphide (or carboxyl propine sulphide). The reaction evidently takes place according to the equation.



Formation and Re-action of $\alpha\alpha\beta$ and $\alpha\beta\beta$ Tribromophenyl propionic Acids.—By J. J. SUDBOROUGH.

The bromination of the α and β bromo and chlorocinnamic acids and their methyl esters has been examined.

The elimination of hydrogen bromide from the bromocinnamic acid dibromides has been studied and the relative yields of cis and trans dibromocinnamic acids determined.

The Oil Contents of some South Indian Oil Seed Cakes.—By J. J. SUDBOROUGH.

The author has estimated the percentages of oil contained in the following types of cake :—

Copra, gingelly, groundnut, castor, hutchellu, hongey and ippe.

The cakes were from different parts of South India and were prepared either by means of an Anderson Expellor, the ordinary country ghany mill, an iron mill or a hydraulic press.

The results indicate that in most cases with the exception of castor seed cake, an appreciable portion of the oil is left in the cake.

Certain samples of copra cake were found to contain as much as 30% of oil.

Experiments on the Distillation of Sandal Wood Oil.—By J. J. SUDBOROUGH and H. E. WATSON.

The Authors describe :—

1. A tilting still for dealing with about 200 pounds of chipped wood.
2. The variation in the physical constants of the oil as the distillation proceeds.
3. The results of re-distilling the oil with superheated steam at different temperatures.
4. The results of vapour pressure determination.

They have compared :—

- (a) The results obtained with new wood and wood one year old.
- (b) The yields of oil obtained from spiked and unspiked wood.
- (c) The yields obtained from (1) healthy, (2) dying, (3) dead wood.

The Distillation of Mysore Forest Woods.—By H. E. WATSON, J. J. SUDBOROUGH, K. UMANATHA RAO, and K. S. DHEERENDER DOSS.

Some twenty samples of Mysore forest trees supplied by the Forest Department as representing the commoner kinds of wood available in the State have been submitted to distillation in a specially constructed retort, and the products analysed to determine the yields of charcoal, acetic acid, methyl alcohol and tar.

The retort is electrically heated and will be described, and the results so far obtained will be given.

Direct Nitration by means of Nitrous Gases.—By R. L. DATTA and P. S. VARMA.

By nitration by means of nitrous gases, ortho-cresol gives 3-nitro-cresol and 3:5-dinitro-o-cresol in good yields. m-cresol gives 4-nitro-m-cresol and 6-nitro-m-cresol. From p-cresol, 3-nitro-p-cresol is obtained. p-hydroxyphenylarsenic acid yields a mono-nitrocompound. Acetophenone gives m-nitro-benzoic acid, iodo and bromo benzene yield p-nitroderivatives, o-iodo toluene yields a mono-nitro product. Chlorobenzene is not acted upon by nitrous fumes. By the treatment of benzene and toluene in the heat, traces of nitro compounds are formed which have however no practical interest.

Iodination by means of Nitrogen Iodide or by means of Iodine in the presence of Ammonia.—By R. L. DATTA and N. PROSAD.

The action of iodine and ammonia has been studied in the following cases. Phenol gives a quantitative yield of 2:4:6—triiodophenol. Ortho-cresol, para-cresol and meta-cresol give in quantitative yield diiodo-o-cresol, diiodo-p-cresol and triiodo-m-cresol respectively. From thymol, 6-iodo-thymol has been obtained. 1:4:5-xenol has been found to yield a mono-iododerivative. Phenolphthalein yields tetraiodophenolphthalein. Ortho-nitrophenol gives on iodination 2:4-diiodo-6-nitrophenol which yields a stable ammonium salt. Meta-nitrophenol yields 2-iodo-3-nitrophenol which however yields an unstable ammonium salt which decom-

poses on keeping. From paranitrophenol 2:6-diiodo-4-nitrophenol has been obtained which does not give any ammonium salt. 3-nitro-1:4-cresol has been found to yield 5-iodo-3-nitro-1:4-cresol and a stable ammonium. The special feature of this reagent is that in all cases quantitative yields of the products are obtained. In view of the fact that both ammonia and iodine in the mother liquor could be conveniently recovered, these methods would serve as the best modes of preparing these iodo-phenols and iodonitrophenols on the large scale.

The following iodinations of hydroxyacids have been achieved. Salicylic acid gives 5-iodo-salicylic acid. From *m*-oxybenzoic acid 6-iodo-3-oxybenzoic acid has been obtained. *p*-oxybenzoic acid yields 3:5-diiodo-6-oxybenzoic acid. A mono-iododerivative is obtained from *p*-hydroxy-phenylarsenic acid.

It has also been found that dimethylpyrone is readily iodinated by means of nitrogen iodide with the formation of 2:6-diiodolutidone which form a stable hydrochloride. From pyrrol, a quantitative yield of tetraiodopyrrol has been obtained and the reaction could be used for the quantitative estimation of pyrrol. Acetylene forms with great ease tetraiodoethylene and phenylacetylene yields triiodostyrol.

Nitrogen iodide also acts as an oxidising agent. For instance, quantitative yields of benzoic acid and quinhidrone have been obtained from benzaldehyde and hydroquinone respectively. Nitrogen iodide also effects the breaking up of organic compounds with the formation of iodoform as the end product of the reaction. Iodoform has been found to be produced from acetone, methylethylketone, diethylketone, acetylacetone, acetylmethylpropylketone, acetylmethylhexylketone, acetoxime, acetophenoneoxime, malonic ester, acetoacetic ester, diethylamine, triethylamine, ethyl and propyl alcohols, and mesityloxide.

On the Decomposition of Nitrogen Sulphide.—By F. L. USHER.

When pure yellow nitrogen sulphide is sublimed in *vacuo* over silver gauze at 100°, a blue sulphide of nitrogen is formed very slowly, accompanied by the evolution of traces of nitrogen. At 115° the formation of the blue compound proceeds a little faster, and the rate is considerably increased at 125° and 139°. If the yellow sulphide contains free sulphur, a new ruby-red sulphide is formed at 125°, and this has the same empirical composition as the blue sulphide. On heating a mixture of yellow nitrogen sulphide with sulphur in *vacuo* at 125° without silver gauze, a dark red volatile liquid is produced, which analysis shows to be nitrogen persulphide (N_2S_4). The persulphide is not formed by direct combination of the yellow sulphide with sulphur, but by the decomposition of an unstable intermediate compound, probably N_2S_3 . A method is given for analysing very small quantities of the sulphides.

A new method of preparing Colloids.—By J. C. GOSH.

If we electrolyse a dilute solution of silver nitrate with a point cathode of platinum by a direct current (2.5 milliamperes) and if during this process of electrolysis, electric oscillations be impressed on this system, the metal ions, as they are liberated, do not adhere to the cathode. The metallic particles run away from one another, and remain suspended in the solution. However the amount of silver held in suspension corresponds to the quantity of direct current passed through the electrolytic cell. The electric oscillations, therefore, only endow the ions as they are liberated, with a force of mutual repulsion.

In this way, the finest solutions of silver, which are green in appearance, can be easily had. Mercury solutions can also be obtained by this method. Further experiments to determine whether other kations behave in the same way, are in progress.

The wave-length of the electric oscillations used is 73 cms.

On the determination of ozone, oxides of nitrogen and hydrogen peroxide in atmospheric air.—By B. SANJIVA RAO.

A summary of previous work is given, and the methods employed are criticised. A method has been devised, in which three samples of air, each of 5–10 litres, are shaken for several hours with an extremely dilute standard solution of sodium nitrite, rendered slightly alkaline. The first sample, prior to treatment with the nitrite solution, is passed through a tube of chromic acid crystals, whereby hydrogen peroxide is removed; the second sample is passed through powdered manganese dioxide, which destroys both ozone and hydrogen peroxide but is without action on oxides of nitrogen; the third sample is collected directly. It is shown that ozone, even in excessive dilutions, oxidises sodium nitrite in solution rapidly and quantitatively in accordance with the equation. $\text{NaNO}_2 + \text{O}_3 = \text{NaNO}_3 + \text{O}_2$. Hydrogen peroxide oxidises the nitrite similarly, but only in acid solution. By estimating the amount of nitrite remaining after shaking with the three samples of air, the amount of ozone, hydrogen peroxide, and oxides of nitrogen can be calculated. The estimation of nitrite was carried out colorimetrically by the method of Griess, and using naphthylamine and sulphanilic acid.

The results of some experiments on the air at Bangalore are recorded.

¹ *Chalybeate Waters from tube wells in the Punjab.* Their significance to the Municipal Engineer and to the Manufacturer.
—By J. H. BARNES and ARJAN SINGH.

A brief history is first given of chalybeate waters and the difficulties which have been experienced in making use of such waters for municipal purposes and in manufactories.

The problem of iron-depositing waters has arisen in the Punjab where deep waters are being tapped by tube wells and a detailed study of such waters from different parts of the Punjab is described. The presence of iron bacteria well known in Europe but hitherto unrecorded in India—such as *Leptothrix ochracea*, *Gallionella ferruginea* (Ehrenberg), *Spirophyllum ferrugineum* (Ellis) and *Crenothrix Polyspora* (Cohn) is demonstrated.

The sub-soil waters of the Punjab show a marked increase in the amount of ferrous iron they contain as the distance from the Himalayas—the source of the water—increases, thus proving a steady flow westwards of sub-soil water.

The contact of these ferruginous waters with an aerating agent such as sea water offers a feasible explanation for the formation of the mineral limestone.

The paper includes a description of the methods of analysis used and full tables of the composition of tube well water before and after the monsoon. In conclusion, recommendations are made for the purification of these ferruginous waters when making use of these for municipal or manufacturing purposes.

Some biochemical factors in the reclamation of alkali soils.—

By J. H. BARNES and BARKAT ALI.

The paper first reviews in brief the sources and nature of the saline matter which causes sterility in alkali soils. The view is advanced that sterility in such soils is not due to any specific toxic effect of the chemicals

¹ This paper will be published *in extenso* in the Congress number of the Agricultural Journal of India.

comprising the saline salts but is due to the physical effect they exert on the protoplasm of the plant cell in causing plasmolysis.

Chemical analysis alone is useless in examining a saline soil with a view to determining either the cause of sterility or the degree of cure effected in reclaiming such a soil for agricultural purposes. It is pointed out in the paper that the direct measurement of the osmotic pressure of the soil salts in solution would be too difficult and lengthy to be of practical utility and the indirect measurement by crop tests lengthy and expensive. This working result is achieved by the use of soil bacteria and measuring their rate of chemical activity. The paper describes the biochemical methods used in determining the chemical activity of carbon oxidising organisms, the ammonifying and nitrifying bacteria and the nitrogen-fixing activity of bacteria of the *azotobacter* type.

Tabulated statements are given of the study of the soils of an experimental farm at Narwala in the Punjab where saline land has been successfully reclaimed and abnormally high yields of crops obtained; as much as 37½ maunds of wheat per acre being obtained in one field.

The paper contains a tabulated statement of crop outturns on the Narwala farm where the biochemical methods described in the paper have been used in reclaiming the land.

Metallic Derivatives of Alkaloids. Part I.—By J. N. RAKSHIT.

The sodium and potassium derivatives of codeine and sodium derivative of narcotine are obtained by boiling them in benzene; and calcium morphine is prepared by rubbing morphine with lime in rectified spirit.

The Sodium Bisulphite Test for Formic Acid and an attempt to reduce the Aliphatic Acids to their corresponding aldehydes.—By S. C. CHATTERJI.

Contrary to Comanducci's statement it has been shown that sodium bisulphite is not at all a convenient reagent for the detection of formic acid. The result of an attempt to reduce the aliphatic acids to aldehydes using Zn. and Mg. has then been given.

Detection of Lactic and Glycollic Acids and a Suggestion about the Constitution of Morphine.—By S. C. CHATTERJI.

After dealing with certain colour reactions of lactic and glycollic acids based on their conversion into acetaldehyde and formaldehyde respectively on treatment with concentrated H_2SO_4 , a new constitutional formula has been proposed for morphine. The suggestion is based on a study of the behaviour of morphine, codeine, indole and proteins containing indole groups towards formaldehyde or acetaldehyde and concentrated H_2SO_4 . The conclusion arrived at is the same as that of Bucherer as a result of his investigation on the action of sulphites or morphine.

Space representation of Nitrogen in Organic Ammonium compounds by means of a single tetrahedron.—By P. NEOGI.

It has been shown in this paper that neither Van't Hoff's cubic, or Willgerodt's double tetrahedron or Bischoff's pyramid representation of nitrogen in organic ammonium compounds explains recent experimental results which are satisfactorily explained by representing nitrogen as a single tetrahedron with the negative radical attached to it but in the secondary sphere of action. The following considerations necessitate the adoption of the single tetrahedron formula :—

- (1) the discovery of isomers of the type $[\text{Me}_3\text{N}.\text{OR}]\text{OR}_1$ and $[\text{Me}_3\text{N}.\text{OR}_1]\text{OR}$ which shows that the fifth valency is different from the other four,
- (2) the number of isomers of the type Na_3bx , Na_2bcx and Nabcdx predicted by the existing configurations never conforms even remotely to experimental results which, however, *invariably* agree with the deductions from the single tetrahedron formula,
- (3) the number of isomers containing one asymmetric carbon and one asymmetric nitrogen atom predicted by the existing formula is absurdly large whilst the tetrahedron formula would yield only four optical isomers which have been obtained experimentally by Harvey and others,
- (4) the discovery of optically active amine oxides $\text{O} : \text{Nabc}$ by Meisenheimer is a crucial proof of the validity of the tetrahedron formula,
- (5) the fact that substituted pyridinium and quinolinium compounds have not been resolved whilst tetrahydro quinolinium derivatives have been resolved is satisfactorily explained by no formula other than the tetrahedron formula,
- (6) the passage of trivalent nitrogen to pentavalency is explained by supposing that trivalent nitrogen in the amines has a plane configuration which, when passing to the pentavalent condition assumes an "in-tetrahedron" configuration and then passes on the complete tetrahedron when pentavalent.

III III

V V

- (7) Owing to the fact that $\text{N} \cdot \text{N}$ is more stable than $\text{N} \cdot \text{N}$, compounds containing two pentavalent nitrogen atoms joined together are not stable and therefore have not been resolved. The non-existence of such compounds is not due to interference as supposed by B. K. Singh. Compounds containing two asymmetric nitrogen atoms separated by and joined to carbon atoms have been obtained as isomers. In this case as we have two *separate* pentavalent nitrogen atoms not joined together, they are capable of existence in the same compound. As a matter of fact carbon is almost unique in forming chains of carbon atoms joined together—a property to which the existence of organic chemistry is due and which is not shared by other elements.

It is to be noted that the idea of a tetravalent configuration for pentavalent nitrogen is to be found in some of the writings of Werner, Meisenheimer and several others. But the systematic development of this configuration for nitrogen have hitherto been wanting so much so that so late as in 1915 Cohen, Marshall and Woodman (*Trans Chem. Soc.*, 1915, 887) wrote that "the choice of space formulae for nitrogen at present lies between the double tetrahedron arrangement of Willgerodt and the pyramid formula of Bischoff" and that in 1916 Singh has been seeking the explanation of the inability of two pentavalent nitrogen atoms in interference deducible from the pyramid formula. It has been the purpose of the paper to show systematically that the single tetrahedron formula explains far more satisfactorily a much larger number of experimental facts than the existing formula for nitrogen.

Potential of the Nitrogen Electrode.—By R. VENKATESWARAN.

The decomposition voltage of normal hydrazoic acid is 1.29 volts, the E.M.F. of polarisation being presumably due to hydrogen and nitrogen. An attempt was made to prepare a nitrogen electrode by coating a hard glass tube with a film of platinum, platinising this, and immersing the tube in a N_{100} solution of N_3 ions, through which carefully purified nitrogen was bubbled. The potential of this electrode was measured against a

decinormal calomel electrode, and was found to be slightly (about .08 volts) negative to hydrogen, an impossible value for a nitrogen electrode. It was proved that the nitrogen was not electromotively active, the measured potential being due to the platinum metal in a solution containing a minute concentration of Pt ions. Subsequently the potential of a platinised platinum anode, at which nitrogen was being evolved electrolytically from a N. Sodium azide solution was measured with an auxiliary calomel electrode during the passage of the polarising current. Results were obtained indicating that the potential of a nitrogen electrode in a normal solution of N_3 ions is very near to that of the bromine electrode. It is also evident that the nitrogen set free during electrolysis of sodium azide differs from ordinary nitrogen, since the latter is electromotively inactive.

Section of Zoology and Ethnography.

President—MR. K. RAMUNI MENON, M.A., *Professor of Zoology, Presidency College, Madras.*

(*Presidential Address.*)

In opening the proceedings, the President disavowed any intention of giving an introductory address and said :—

However, as President of the Section, I think I may say that I note with pleasure the increasing interest in zoological investigations evinced in this country as evidenced by the rapidly-increasing output of zoological work in which the Indian Museum takes such a predominant part, and incidentally also by the number of zoological papers being presented to the Section this year. When the people of this country really and seriously require original work to be done in zoology as in other subjects. I feel confident that workers will be forthcoming in zoology no less than in other subjects. In the meantime, those who by their position or by inclination are interested in zoology will cordially appreciate such additional opportunities and facilities as are thrown up by the ever-advancing wheels of administration, and we may ungrudgingly welcome the fact that in the newly-established University of Mysore zoology forms one of the principal subjects of study. With the ample backing of the Mysore Government, I hope we may reasonably anticipate a fruitful and prosperous future for zoological research in this city. There is one other point. You will notice that this year our section comprises not only zoology but ethnography as well. Personally, I am not inclined to regard this as an ideal grouping, and I have no doubt that as workers in ethnography increase, a separate Section will have to be created for them. But for the present, the arrangement is the most practicable, and, in view of the obvious relation of physical anthropology to zoology, is a logical one. While we zoologists may have little to offer at present which will interest ethnologists, I am sure we shall be benefited by being associated with a subject of such surpassing human interest.

Recent Experimental Enquiries concerning the so-called "Renal Portal" System.—By W. N. F. WOODLAND.

In the rains of 1915 I ligatured the renal afferent veins of three toads (*Bufo melanostictus*). They all recovered from the operation and for some weeks at least fed well and appeared to be perfectly healthy. One died exactly six weeks after the operation, another I killed eight weeks after the operation, and the third had lived twelve weeks when I killed it. In all three toads, when examined post-mortem, the renal afferent veins were found to be still well ligatured (no new veins having formed), the kidneys

were perfectly healthy and had much increased in weight (the ratio Weight of kidneys/Weight of body was much greater in these toads than in normal toads), though the renal arteries had not increased in size. In all three cases however (even in the three-month toad which appeared when killed to be in perfect health, eating well, active and shedding its skin on the night previous) the liver was in a diseased condition, large cysts having developed in it, which condition was apparently solely due to the large amount of additional venous blood poured into it via the anterior abdominal vein. Had it been possible to divert the blood excluded from the renal afferent veins into the main venous system instead of into the liver capillaries, the three toads would have remained in perfect health.

In 1916 I repeated these experiments and obtained similar results. In the case of one toad which lived nearly six weeks, I analysed the urine while the animal was in good health (active and feeding like normal toad) and ascertained that the urine secreted each day was normal in quantity (total nitrogen estimation) as compared with that of normal control toads.

In 1915 I also ligatured one renal afferent vein in each of four toads, one surviving three and a half weeks and another eight weeks after the operation; the other two I killed after eight weeks and twelve weeks respectively. In all cases the kidneys were together slightly larger than in normal toads and were equal in size to each other, the kidney with the ligatured vein sometimes being larger than the other.

In 1915 and 1916 I cut out a piece of the anterior abdominal vein in a number of toads and found that they either died, or, after a certain number of days, re-formed a new abdominal vein; in no case did the toad assume a healthy appearance and remain devoid of an anterior abdominal vein.

The conclusions I drew from those results were that the arterial supply of the kidney is the only essential one, the kidney not making use of the venous blood supplied by the renal afferent or other veins.

In 1916 I devised and successfully carried out a number of decisive perfusion and other experiments on the frog (*R. tigrina*) kidney. The most important experiment I performed (repeated twelve times) was to anaesthetize a frog with ether, remove all the brain except the cerebellum (thus preserving the respiratory centres), ligature the renal afferent vein (which was cut behind the ligature) and pelvic vein of one side and run in normal saline (with or without a trace of urine) through a cannula inserted into the coeliaco-mesenteric artery and connected with a perfusion bottle. The frog continued to breathe well for several hours, thus ensuring the oxygenation of the saline solution traversing the renal arteries and the rest of the body. The ligature of the pelvic and the cutting of the renal afferent of the same side posterior to the ligature ensure that the pressures in the two iliac arteries are approximately equal and therefore that the pressure in the unligatured renal afferent bears much the same relation to the pressure in the renal arteries as exists in life. The ureters were carefully dissected out and inserted each into a glass collecting tube. The results of these experiments were that during the time that the ligatured renal afferent vein remains empty and the pressure in the kidney of that side (the "arterial" kidney) is therefore less than the pressure in the other kidney, the secretion of the arterial kidney is less, but when the ligatured renal afferent vein becomes distended with the perfusion solution from the renal arteries, then the secretions of the two kidneys are produced at an equal rate, though the urine of the arterial kidney is more dilute than that of the normal kidney.

Urine obtained after ligaturing the veins carrying blood to the kidney, and causing increased pressure in the renal arteries by ligaturing the coeliaco-mesenteric and the two iliacs in nitrogen contents (no perfusion fluid used), was found to be as strong as normal urine.

In another series of experiments I connected the iliac artery with the renal afferent vein of the same side by means of a glass U tube and so

caused a flow of arterial blood and oxygenated saline to traverse the venous channels of the kidney: urine was produced abundantly while the renal arteries were intact, but on *ligaturing these the secretion entirely ceased.*

The conclusions to be drawn from all the above experiments (to be published in full in due course) are (1) that *toads and frogs can live with their kidneys solely supplied by the renal arteries*, the venous supply to the kidneys being unessential; (2) that although the venous supply to the kidney maintains blood pressure in that organ, yet since this function can readily be taken on by the penetration of the arterial blood into the venous sinuses of the kidney, it is not an essential feature of the venous supply; (3) that experimental facts prove *that the arterial capillaries of the kidney open into the venous sinuses of the renal venous meshwork ("renal portal system") after the former have supplied both the Malpighian capsules and the tubules, and that therefore the venous blood does not come into contact with the excretory cells in a functional capacity, i.e. the venous blood never penetrates under normal conditions into the arterial intertubular plexus or the glomeruli*; (4) that the fact that in my perfusion experiments the urine of the arterial kidney was more dilute (in nitrogenous contents) than the urine of the normal kidney (i.e. with a venous supply) is to be accounted for by the further facts that in the normal kidney of these experiments the venous blood supply contained more diuretic in solution (due to addition of waste products from the leg tissues) than the arterial blood (diluted by perfusion saline introduced into renal arteries) and therefore diuretic diffused from the venous sinuses in the kidney into the arterial intertubular capillaries, thus making the arterial blood in these capillaries strong in diuretic; in the arterial kidney this venous supply was absent and the arterial blood consequently weaker. Since under normal conditions the arterial blood contains as much waste nitrogenous matter in solution as the venous, no such diffusion would occur, and the urine produced by an arterial kidney is as strong as that produced by a normal kidney (as proved by the non-perfusion experiments quoted above and by the experiments of Bainbridge, Collins and Menzies). Evidence from all sources therefore proves that the renal venous meshwork ("renal portal" system) is, under normal conditions, devoid of junction.

A revision of the Indian Species of *Meretrix*.—By J. HORNELL.

The genus *Meretrix* contains a number of estuarine species. Those living in the waters of Continental India are exceedingly variable in regard to colouring, shape, or both combined. Ignorance of this fact has led to great taxonomic confusion and to the undue multiplication of species. There are really only two good species living on the Indian mainland, viz. *M. meretrix* and *M. casta*. The former is very variable in colour, particularly when young, but is stable in size and shape when mature; the latter varies with differing environment, resulting in the production of several varieties and local forms. The forms found in the east coast estuaries of *M. casta* are true to type within narrow limits: while those *meretrix* living on the west coast vary greatly and present several varieties, which, however, are all connected by a perfect series of intermediate variations. The author gives a key to the Indian Species and varieties of *Meretrix*.

A new Protozoan cause of widespread Mortality among Marine Fishes.—By J. HORNELL.

Several theories have been advanced to explain the annually recurring mortality among fishes and crabs on the Malabar and S. Canara Coasts. Among these may be specially mentioned (1) Suffocation by excessive

mud in suspension, (2) influx of putrid water from rivers into the sea. None of these theories can be regarded as satisfactory. The result of certain investigations made on the west coast shows that the mortality is to be directly traced to the immense development of Euglenid swarms in inshore waters after the rains. The water at this time is highly charged with dissolved organic matter and thus favours the growth and multiplication of Euglenids. The effect of the vast superabundance of Euglenids is to render the water thus contaminated unsuitable for the existence of all kinds of fishes, crustaceans, and molluscs. Many of these animals are thrown ashore moribund or dead; great quantities of them are stupefied and die and putrify in the sea. The foul water thus produced extends seawards under favourable conditions and thus spreads the area of the plague and causes further mortality among fishes. The Euglenid concerned differs from typical fresh-water Euglenids. The author gives details of its structure and behaviour.

A method of cutting sections of the wings of Insects.—By

E. H. HANKIN.

The wing is first placed in a solution containing ammoniacal silver nitrate, Rochelle salt, and alcohol. After a time varying from a few minutes to a few hours the wing is thereby blackened owing to the deposit of a thin film of metallic silver. The wing is then washed in 50% alcohol and placed in rectified spirit. It is then embedded in jelly. The jelly used is a strong agaragar containing eight per cent of hyposulphite of soda. The portion of the lump of jelly containing the wing is cut into ten slices of equal thickness by means of a Gillette razor blade. The slices are threaded on to a wire in the right order after trimming to a convenient size. They are then placed in a half per cent solution of tartaric acid in 70 per cent glycerine for 24 hours. The acid causes precipitation of finely divided sulphur (by decomposition of the hypo) in the jelly which is thereby rendered white and opaque. The sections therefore are seen in black on a white background. The sections are mounted in a cell containing gelatine jelly.

A number of wings of different kinds of insects treated in this way were exhibited.

Anthropological notes on the Eurasians of Indo-Portuguese descent in Cochin.—By L. K. ANANTAKRISHNA IYER.

Introduction.—Origin and History of the Community. *Habitat.*—Inter-marriage of the Portuguese with native women in former times. *Marriage customs.*—In former times and at present. *Inheritance.*—Religion. *Funeral customs.* *Occupation.* *Dress, appearance, &c.* The paper was illustrated with lantern-slides.

The Occurrence of Iridocytes in the Batrachian larva, *Microhyla ornata* (Boul.).—By C. R. NARAYAN RAO.

The striking feature in the colouration of the larva of *Microhyla ornata* and *M. rubra* is the occurrence of a bright dorsal metallic (golden) band and of silver brilliance on the sides and the ventral surface of the abdomen, and probably used as a warning advertisement in consequence of the floating habits of the tadpoles. The dorsal band is formed of very fine plates of guanine or iridocytes while the silver brightness is due to the reflecting tissue or argenteum, which is not guanine. On chemical analysis, it is found that the substance of iridocytes and argenteum is identical with that met with in the iridescent tissues of fishes.

The only organ that bears both chromatophores and iridocytes is

the lung whose homology with the air bladder of fishes is corroborated on the chemical side.

On the habits of the Hilsa (*Clupea ilisha*) and their artificial propagation in the Coleroon.—By B. SUNDARA RAJ.

1. *The Hilsa*.—Otherwise called the Indian Shad, is a valuable food-fish in India.

2. *Distribution of the Hilsa*.—Extensive. In peninsular India it is known to occur only on the east coast. The apparent success of the Madras Fishery Department to introduce the fish into the Ponani river (Malabar) in 1909.

3 *Size*.—Adult males attain a length of 30 to 35 cm. and are smaller than adult females which reach a length of 35 to 40 cm.

4. *Habits*.—A knowledge of the habits essential for pisciculture—A summary of all that is known of the habits of the Hilsa and my own observations at the Lower Anicut (Coleroon).

5. *Effect of weirs on the Hilsa fishery*.—Dr. Day's condemnation of weirs and his prediction (1869) of the extermination of the Hilsa. Sir F. Nicholson's reply (1909). The conclusion that Hilsa since the loss of their upstream spawning grounds have probably found suitable places for breeding in streams unfettered by weirs.

6. *History of the Hilsa Hatchery in the Coleroon*.—Day's proposal (1868) to construct fish passes abandoned as impracticable. Mr. Wilson's suggestion (1908) that pisciculture is the only satisfactory and final solution of the Hilsa problem. The construction of the Coleroon Hatchery the first of its kind in India (1909) and a description of the Hatchery.

7. *The Method*.—Mr. Wilson succeeded in hatching Hilsa eggs in 1908 and 1909—Particulars of the process as determined by a series of experiments conducted by me at the Hatchery last August, when about 10 million fry were successfully hatched out.

8. *Conclusion*.—The practicability of artificially impregnating and hatching Hilsa eggs has been established beyond doubt. The rearing of the delicate fry has not yet been attempted and remains yet to be done.

Notes on some South Indian Cecidomyiids causing galls in grasses.—By Y. RAMACHANDRA RAO.

Paddy is subject to a disease known variously as "Anaikombu," "Thandeethu," "Kodu" and "Silvershoots". It manifests itself by the formation of a long hollow shoot instead of the normal ear-head, and is a source of loss to the ryot.

The silvershoot is a gall caused by a Gall-fly : *Pachydiplosis oryzae* : the eggs are laid on the plant, and the maggots that hatch seek the growing tips of the shoots and cause the formation of the tube-like gall. The maggots pupate inside and in about 6 days transform into flies, which emerge through a hole bored through at the tip.

Various wild grasses at Coimbatore and in several places in the Bellary, Kurnool and Godavari Districts were examined in the attempt at finding the wild host plant of the Paddy gall-fly. Galls were noticed in the following grasses :—

1. *Panicum fluitans*, } The same fly attacks both the grasses :
2. *Panicum punctatum*, } life-history fully studied.
3. *Cynodon dactylon* : A collective gall is formed : life-history studied.
4. *Ischaemum ciliare* : Coimbatore : Fly reared.
5. *Panicum stagninum* : Godavari : fly reared and probably identical with the paddy fly.
6. *Paspalum scrobiculatum* : (wild variety) : Fly not reared.
7. *Andropogon annulatus* : Fly reared.

8. *Andropogon Schoenanthus*, } Flies not reared.
 9. *Apluda varia*. }
 10. *Iscilama* spp: 2 Flies at Palur.
 11. *Ophiurus corymbosus*, } Flies not reared.
 12. *Oryza sativa* (wild variety.) }
 13. *Iachemum pilosum*: Galls noted in black soils in Bellary District: flies reared. These are probably the galls forming the subject of a paper on "Galls on an Indian grass" by Mr. Boodle: Kew Bulletin No. III, 1910.

Except in the case of *Panicum Stagninum*, the flies bred out proved to be distinct species, each restricted to a single grass.

Numerous parasites attack these gall-insects and fall into 2 groups: In one the chalcids,—the wasps lay their eggs directly on or near the maggots. In the other—the Proctotrupids—the wasp searches out the eggs of the gall-fly and deposits eggs therein, as exemplified by *Platyojaster oryza*.

Indian Tadpoles.—By N. ANNANDALE, and C. R. NARAYANA RAO.

The tadpoles of most of the frogs and toads that inhabit the plains of India are now known and have been or will shortly be described in detail, but in a considerable proportion of the species that live in the Himalayas and the Western Ghats little has yet been discovered about the life-history. In a paper to which this may be regarded as a preliminary note we hope to give full descriptions of the larvae of about one half of the Batrachian Anura of India proper and Assam.

Those tadpoles that have been found in the mountainous districts of the Indian Empire are of special interest on account of the adaptations to environment they exhibit. Most of their peculiarities are correlated with life in rapid-running water in which it is important that they should not be carried away by the current or if-carried away should float lightly on the surface. In some tadpoles from the Himalayas and other mountain regions situated to the east of India (for example, the larvae of *Rana afghana*) we find a large sucker or adhesive organ formed on the ventral surface of the abdomen, while in others the lips are modified to perform the same function. This is the case, for instance, in the tadpole of *Bufo asper*. Other larvae from the same streams (those of several species of *Megalophrys*) live in small crannies at the edge but are provided with an enormous funnel-shaped structure that surrounds the mouth and can open like an inverted umbrella in such a way as to support them floating on the surface with the tail held vertically. The tadpole of *Rana beddomei*, which lives in the hills of Western India, is modified for an amphibious existence by the early outgrowth of the hind limbs and the degenerate character of the fin-membrane of the tail; it can thus skip away over damp rocks at the approach of a flood. Some allied species from the same streams have lost the horny teeth characteristic of the larvae of most families of Anura, but in this case we do not know what the modification means.

The Indian tadpoles of still water mostly belong to two types: (1) tadpoles in which there is no mouth-disk and no horny beak or teeth and in which the spiracle is situated in the mid-ventral line, and (2) those that have a fleshy disk surrounding the mouth, with a horny beak in the middle and armed with transverse row of minute horny teeth; in such forms the spiracle is situated on the left side of the body. Indian tadpoles of the former type all belong to the family Engystomatidae, while those of most of the Ranidae and Bufonidae belong to the latter. In the Ranid genus *Oxyglossus*, however, there is no mouth-disk, while in certain species of *Rana* the horny teeth, as already noted, are absent.

At first sight adaptive modifications in structure frequently mask taxonomic features in tadpoles. A good instance of the kind is to be found in the genus *Megalophrys* of the family Polobatidae. Most of the larvae of this genus as yet known have the peculiar mouth-float briefly described above and also remarkably long and slender tails, but the tadpole of *M. hesseltii*, which lives in Burma and the Malay Region, is of a much more normal type. One *Burmo-Malayan* species of *Microhyla* (*M. annectens*) of the family Engystomatidae, in which the mouth-disk is usually absent, has, on the other hand, a funnel-shaped mouth-float analogous to that of tadpoles of the peculiar *Megalophrys* type, though differing in details of structure.

It would thus seem that convergence often plays a more important part in the superficial characters of Anurous larvae than genetic relationship, but it is possible that in some instances the convergence has taken place in the adults rather than in the larvae and that species in which the adults seem to be related actually resemble one another because of parallel evolution rather than on account of descent from a common ancestor. On the other hand, the resemblance between tadpoles of different ancestry is often quite superficial and one finds that adaptations at first sight similar, have been produced in different lines of modification. For instance, in those Oriental species of *Bufo* in which the mouth has become a powerful adhesive organ, the modification consists mainly in a great enlargement of the lower lip, whereas in the larva of a species of *Helophryne*, an African frog of the family Cystignathidae, a superficially similar structure is produced by the equal enlargement of both lips.

It is noteworthy that a tadpole very like that of *Helophryne* but not yet assignable to any known Indian species or genus, occurs in the hill-streams of Cochin. Judging from what we know of other tadpoles, we would not be surprised to find, when the adult is discovered, that a real relationship exists.

Notes on the Anatomy of a Double Monstrosity in the Chick.

—By D. R. BHATTACHARYA.

The monster consists of two individuals, intimately connected together along their ventral side. There is, however, only a single head. There is a distinct neck, vertebral column, limbs and limbgirdles, to each individual. The hinder region of the medulla Oblongata divides to form two spinal cords. The sterna of the two individuals do not meet together as was to be expected, but the ribs of the adjacent sides of the two individuals coalesce to form a sternum, which thus takes a lateral, instead of a ventral position. Each sternum, therefore, is contributed to, in its formation, by both the individuals. The body-cavities of both the individuals coalesce, and lie in the space situated between the two sterna and their attached ribs. Most of the internal organs, especially those which are common to both the individuals, lie in this joint body-cavity. There is only a single set of the following organs common to both the individuals:—The heart, lungs, the greater portion of the digestive canal from the gullet down to the middle of the ileum, the trachea, bronchi, liver, spleen, pancreas, etc. The single heart supplies both the individuals. Each individual, however, possesses a pair of kidneys, rectum, cloaca and bursa Fabricii.

An Instance of Mutation *Coccus viridis* (Green) a Mutant from *Pulvinaria psidii* (Maskell).—By K. KUNHI KANNAN.

Saltatory variations in green bug. The typical green bug has seven antennal segments. In Mysore it was so when it first appeared but the number has been reduced to three except in specimens found on a single plant in Bangalore. In Ceylon the number is seven. In Uganda there

are two forms, one typical the other for some time regarded as a sub-species, but recently given specific rank. In Java there are two forms, one round, the other long—both showing loop more or less but with 8 antennal segments instead of 7. These therefore are structurally nearer *P. psidii*. The specimen from Lagos is said to agree with the typical form.

Similar antennal variability in *P. psidii* specimens showing loop, without ovisac but with the eggs laid directly beneath the body have been found. The variability in the same direction is explicable only on the hypothesis that the forms of green bug are derived from *P. psidii*. This hypothesis was discussed.

Section of Botany.

President—RAO BAHADUR K. RANGA ACHARI. M.A., L.T.,
Government Lecturing Botanist, Agricultural College, Coimbatore.

Tinnevely Fauna.—By K. RANGA ACHARI.

The flora of the Tinnevely District may be considered to be an epitome of the whole of the Madras Presidency, as almost every feature of which is represented within this area. There are two distinct botanical regions in this district—the eastern and the western.

The eastern region is a vast plain extending from about the base of the hills to the shore, and it supports a vegetation more or less similar to the plants growing on the eastern side of the Presidency from Ganjam to Cape Comorin, although there may be well defined areas with different sets of plants, and hence distinguishable one from the other, while at the same time we meet with plants of very wide and even distribution. The sea-coast abounds in sea-weeds, littoral species and sand-binding plants, and the vegetation towards the inland is of the stunted type, as this region is very dry and hot on account of its peculiar geographical position.

The western region consists of the southernmost end of the Western Ghats separated from the long chain by the Palghat gap. This region is botanically the most interesting. The vegetation at the foot of the hills and at the lower elevations consists of mostly scrubby jungles characteristic of the Madras Presidency. Amidst these, however, occur species of plants peculiar to these regions, such as *Eugenia rubicunda*, *Anogeissus pendula*, *Alphonsea sclerocarpa*, etc. In certain places near Mundanthurai, Anonaceous species predominate, showing Malayan affinities. Four new species of plants, *Diospyros Barberi*, *Grewia pandaica*, *Aglaiia Barberi* and *Farmeria indica*, were found flourishing here.

Viewed from a broad standpoint, the higher elevations of the hills in this district present the same characteristics as those of the Anamalais, Pulneys and Nilgiris, but as we proceed southwards we notice features peculiar to this district. The forests are evergreen and moist for the greater portion of the year. The species of plants, *Dirotocanthus grandis*, *Hedyotis purpurascens* and *Orthosiphon comosus*, that are confined to these hills lend a charm to the landscape. There are over thirty species of plants endemic to this region and most of them are found in the southern part of the Western Ghats. Recently two new species of Compositae, *Senecio Calcadensis* and *Vernonia Ramaswami*, were discovered. One species of *Crotalaria* and two species of *Vernonia* are awaiting determination.

The Indian Species of *Iseilema* Hack.¹—By R. S. HOLE.

1. Existing confusion regarding the definition of the species.
2. Revision of existing definitions and key to the species.

¹ This paper will be published *in extenso* in the Congress number of the Agricultural Journal of India.

3. Importance of a detailed study of wild species with reference to (a) economic questions and (b) the problem of the origin of species, as indicated by a study of this genus.

The Method of Inheritance of certain Characters in Rice.—*By*
F. R. PARNELL.

This is a continuation of a paper given at the Science Congress in Madras two years ago.

Certain characters, there described as simply dominant, are now seen to be due to two factors. At least four factors are concerned in the various types of awning investigated.

Several types of gametic re-duplication were illustrated. These include two cases of coupling of separate factors giving a result which was previously regarded as the effect of one factor on several organs.

The Economic Significance of the Root-Development of Agricultural Crops.¹—*By* ALBERT HOWARD, and GABRIELLE
L. C. HOWARD.

The detailed study of the root-systems of the various agricultural crops has been greatly neglected in the past. Hitherto far too much attention has been devoted to the above-ground portion of the plant and it has almost been forgotten that a very large part of any crop consists of the root-system which is ordinarily out of sight. This omission to study the relation between the soil and the distribution of the roots is a common feature of the variety trials which nowadays form so large a part of Experiment Station work.

The object of this paper is to show that a comparative study of the root-systems of a set of varieties throws a considerable amount of light on the relations which exist between the most suitable type of crop and the soil in which it grows. The results of variety trials often become considerably clearer from a study of the roots of the various varieties tried.

For proper root development, one of the conditions necessary is good soil aeration. Now in the alluvium of the plains of India one of the most difficult things is to manage the soil so that its aeration is not interfered with by rain or by irrigation water. The crumb structure of fine alluvial soils which is so easy to produce is also readily lost under monsoon and irrigation conditions. In consequence, the soil and the roots of the crops cannot obtain sufficient oxygen and in many cases carbon dioxide accumulates. The crops suffer from lack of aeration in the soil and oxygen becomes a limiting factor. This is the explanation we have suggested for a whole series of phenomena relating to crops on the Indo Gangetic alluvium. All the facts so far obtained fit into our aeration theory and we have come to regard the surface layer of the Bihar alluvium as a vast oxygen filter separating the atmosphere from the sub-soil water, which analysis shows is particularly poor in dissolved oxygen. All soil-aerating agencies like surface-drainage at once increase production provided the supply of organic matter in the soil is adequate. Now if this is true and if the Bihar alluvium does act as an oxygen filter we should expect to find that all the varieties which really thrive during the monsoon phase in this tract are surface rooted and that very deep rooting kinds would not do well. To some extent, a similar rule ought to hold in the cold weather (*rabi*) crops but not to quite the same extent as in these crops the rainfall between sowing time and harvest is small and during this period soil-aera-

¹ This paper will be published *in extenso* in the Congress number of the Agricultural Journal of India.

tion is at its best. We have from time to time investigated this point and have dealt with some of the results obtained in the present paper.

1. LINSEED.

The Indian linseed crop falls into two main classes:—

(a) The large seeded, early, little branched types of the soils of the Peninsula.

(b) The small seeded, late, much branched forms of the alluvium of North Bihar and the Eastern Districts of the United Provinces.

Associated with these differences in the above ground characters are differences of equal magnitude in the root-systems. The linseeds of the Peninsula are deep-rooted, the branching of the tap root taking place mainly at a point about a foot below the ground level. The linseeds of the alluvium are shallow rooted; the main tap root sending out numerous strong laterals parallel to and near the surface of the ground. It would appear that soil aeration is the dominant factor in the type of linseed grown in the two areas in which this crop is mainly concentrated. On the soils of the Peninsula, the cracking of the soil enables the moist subsoil to be aerated. On the alluvium, the roots are compelled to run near the surface so as to secure a sufficient air-supply.

2. GRAM.

The distribution of the gram crop in India depends chiefly on two factors—soil temperature and soil aeration. Gram is an important cold weather crop to the north of a line joining Bombay and Patna and is not found to any great extent on the warmer soils to the southward. In the gram tract itself, the density is greatest where the natural aeration of the soil is above the average.

That the distribution of this crop in the gram area depends on the aeration of the soil is supported by all the results obtained at Pusa. The best crops are obtained in dry years on high, well-drained soil. On stiff badly aerated plots the yield falls off and the root development is shallow. In wet years, the yield is inversely proportional to the length of the tap root.

3. WHEAT.

Very little work has been done in India in tracing the connection between the root-systems of wheat varieties and their suitability for certain types of soil. The matter, however, is being taken up at Pusa and it is possible to refer to some of the preliminary results.

Some very interesting details have been obtained on this point in connection with the distribution of Pusa 12. Pusa 12 is a deep-rooting, high-yielding variety. It was isolated from a mixture in the Botanical Section at Pusa where it was found that this type gave excellent results on the lighter wheat soils of the Experiment Station but was apt to be disappointing on heavier lands. When tried in the United Provinces however, it quickly came into favour. Excellent crops were obtained; the size of the ears and the yield were greater than anything that had been obtained at Pusa even with the best cultivation. The soil of the alluvium of the United Provinces are more open than those of Bihar, and this deep-rooting wheat immediately responds. On the other hand, the wheat which suits Bihar best is Pusa 6, a shallow-rooted variety which does not do well in the drier wheat-growing areas of the Indo-Gangetic plain. Here the shallow-rooting is a distinct disadvantage.

4. HIBISCUS SABDARIFFA AND H. CANNABINUS.

These two species of fibre plants, which are usually sown at the break of the rains in Northern India, differ greatly in two respects—in the amount of branching and in their tolerance of moist soil conditions. The varieties of *Hibiscus Sabdariffa* are much branched plants which thrive in the wettest monsoons and show little sign of wilt. The types of *H. can-*

nabinus, on the other hand, are tall, erect plants which, when grown in the ordinary way for fibre, branch little but are particularly prone to wilt. These distinctions between the two species are correlated with marked differences in the root-systems. The main tap root of *H. Sabdariffa* is comparatively short but there is a great development of lateral roots which run parallel and quite close to the surface. The root-system is extensive but it is concentrated near the surface of the ground, and in very wet seasons leaves the soil and grows out into the air. The development of the aerial roots all over the surface of the ground was very marked in the wet monsoon of 1916. In *H. cannabinus*, the tap root is deep and the development of the laterals is not concentrated near the surface. The root-system in this species is much deeper than in the case of *H. Sabdariffa*. The general connection between the depth of the root-system and the liability of the two species to wilt will be evident. In the case of *H. Sabdariffa*, the aeration of the roots is easy and the crop thrives even in wet years. In the case of *H. cannabinus*, aeration is more difficult and the plants are very liable to wilt.

5. JAVA INDIGO.

Up to the present, we have considered the root-systems of crops which are either grown in the monsoon or in the cold weather. Bihar agriculture, however, has to deal with a plant—Java indigo—which is grown all the year round including the hot months of April and May. Any successful type of plant must accommodate itself to a set of soil conditions ranging from extreme wetness in the monsoon to comparative dryness in the hot weather.

Java indigo as grown in Bihar is an exceedingly mixed crop and consists of a large range of types which however fall into two main classes as regards branching—(1) bushy types which branch to very varying degrees from the base, the branches coming off nearly at right angles to the main axis, and (2) tall vertical types whose branches arise at an acute angle from the stem. These two conditions may be shortly described as the bush type and the vertical type. Running through both these classes of branching are great differences in the rate of growth and in the time of flowering. Some of the types are early; others are exceedingly late. Some grow slowly; others much more rapidly. All grades of intermediate naturally occur.

A general correspondence between the mode of branching of the stem and of the root exists in this crop. In the bushy types which branch at right angles to the axis, the lateral roots are also given off at right angles to the main tap root. In the vertical types, the lateral roots arise at an angle very similar to that in the case of the branches.

Five types of rooting have so far been distinguished including two in which most of the root-system is near the surface. These withstand the moist soil conditions of the monsoon much more successfully than the deeper rooted types.

Recent *Oxalis* Introductions to India.—By C. C. CALDER and M. S. RAMASWAMI.

This paper records the recent spread to India of some six species of *Oxalis*, a genus which finds its highest development as regards number of species in South Africa and temperate S. W. America.

One of the number *Oxalis Corymbosa* A. DC. has already occupied the serious attention of Australian agriculturists. It is probably of quite recent introduction here but has succeeded in establishing itself with dangerous rapidity in parts of India.

The authors call attention to its presence and cite its history in Australia as indicative of the trouble it may become to Indian Agriculturists.

The genus *Oxalis* is geographically very unstable and a discussion of the distributional history of the remaining species is prompted by their now recorded presence as wild plants in India.

In conclusion the authors call for the co-operation of systematists and others engaged in botanical pursuits in recording the arrival and the success or failure of exotics in establishing themselves, in India.

Note on a Malformation of a Pine-apple (*Ananas*).—By P. F. FYSON.

A malformation of the Pine-apple is described in which the receptacle had grown out laterally and bore a very large number of small flowers in an irregular formation, recalling on a large scale the Cockscomb variety of the cultivated *Celosia*. The tissues were found infested with an intracellular plasmodium, to which the fasciation was in all probability due.

Note on the Killing off of a True Water Plant (*Scirpus micronatus*) by a Plant of firm though moist land (*Ammania Rotundifolia*).—By P. F. FYSON.

Scirpus micronatus L. which forms a dense fringe round the shores of the lake at Kodaikanal has been dying off at certain depths, while growing well in deeper as well as in shallower water. Where this happens the roots are surrounded by a dense matting of thin stems and narrow leaves which though different in appearance have been traced to the *Ammania rotundifolia* Ham which grows on the adjoining bank.

Oecological Notes on the Flora of the Pulney Downs.—By P. F. FYSON.

Attention is drawn to certain plant associations and special adaptations exhibited.

The Inflorescence and Flowers of the Banana (*Musa sapientum*) and its wild relative (*Musa superba*).—By W. BURNS, V. G. MANDKE and P. J. DHUNBHURA.

The paper describes a research in progress, the aims of which are :—

(1) to observe accurately the development and morphology of the inflorescence and flowers in *Musa sapientum* and *Musa superba* ;

(2) to study the phenomena of pollination and fertilisation in these species ;

(3) to study the seed production of *M. superba* and the non-production of seed in *M. sapientum*.

The *transition-leaves* that herald the appearance of the inflorescence are described and a theory put forward to account for their fewness in *M. sapientum* and their abundance in *M. superba*. Variations in the bracts both as to shape and axillary flowers are described. The various organs of the several types of flowers are described and special attention is given to the perianth and androecium. It is concluded that the flower of *Musa* is undoubtedly developed from the usual monocotyledonous type, and that its present form is due to (a) suppression of the posterior stamen, (b) the reduction of the two anterior members of the inner whorl of the perianth and their fusion with the three similarly reduced members of the outer whorl, and (c) the development of the remaining member of the inner whorl as a hood-like body.

Sections of the ovules of both species are described. The embryosac contents have not yet been clearly made out. Crosses made both ways

between the species resulted in seed production. It is proved that the banana fruit swells without pollination but that of *M. superba* does not. The influence of pollen of a red variety did not show when used to fertilise a yellow variety of banana. The origin of the edible pulp is stated. An interesting variant of the banana, producing in normal circumstances 25 "hands," is described and its possible heritability discussed.

Observations on Pollination in *Alysicarpus*.—By K. CHERIAN JACOB.

The whole genus *Alysicarpus* possesses in the flower an interesting explosive mechanism for the sudden discharge of pollen into the air or on an insect-visitor. The Indian species of *Alysicarpus* can be divided into two groups, one with glumaceous calyx enclosing the corolla and the other with small calyx reaching to only about half the length of the corolla. *A. rugosus*—a representative of the glumaceous calyx group explodes its mechanism only when visited by *Nomia oxybeloides*. Unexploded flowers do not set fruits at all. *A. vaginalis*—a representative of the small calyx group—is capable of exploding its mechanism without the help of any external agency and throws a cloud of pollen upwards showering the same on the flowers of the neighbouring plants. The usefulness of this adaptation in securing cross-pollination is evident from the fact that this species possesses a gregarious habit. In fact, in a patch of ground 7 inches in diameter, the branches of 9 different plants could be traced and one square foot of ground covered by the plant showed on an average about 90 different inflorescences.

So, in the above we have an instance of a common plant which ensures cross-pollination by the spontaneous explosion of its flowers and without the help of any external agency.

The irritability of the Bladders in *Utricularia*. II. Structure and Mechanism.—By T. EKAMBARAM.

1. The structure of the irritable hairs is described and compared with those of aldrovanda.
2. Part of the ridge surrounding the mouth is shown to act as a spring hinge which draws down or pushes up the valve.
3. The positions assumed by the valve before and after irritation is shown to be due to a difference in the dimensions of the two layers of cells that make up the valve. The mechanism is explained.
4. The function of the margin is also partly explained.
5. The hungry condition of the bladder is brought about by all the tissues becoming turgid.
6. The result of irritation is taken to be a momentary loss of turgidity in all the tissues.

Variation in some Himalayan liverworts.—By S. R. KASHYAP.

Four species of thallose liverworts are described showing a considerable degree of variability.

1. *Targionia hypophylla*. Already worked out by the writer and also by Miss O'Keefe. (New Phytologist, Vol. XIII, Nos. 6 and 7 and Vol. XIV, Nos. 4 and 5). The chief features of interest here are:—(a) the presence of antheridia on the usually described disc-like ventral shoots, also on shoots having more or less well-developed wings and lastly even on the main shoot in the form of a dorsal cushion. (b) The different degrees of development of the teeth in the involucrel valves. In some specimens they are well-developed throughout the whole margin of the valves, in others feebly developed or quite absent on the greater part of the margin.

2. *Aneura Indica* St. n. s. Great variations in habit and the shape of the dorsal epidermal cells. The plants may be thin loosely attached to the substratum, very slightly branched or simple, leading through various transitional forms to those which are firmly fixed to the soil, have thick lobes and are very much branched. The dorsal epidermal cells may be quite flat, slightly convex externally, dome-shaped, or conical and distinctly papillate with distinct spaces between them. These variations in habit and structure seem to depend on climatic conditions in which the plant grows.

3. *Metzgeria pubescens* (Shrank) Raddi. The usual form found in Britain has ten or eleven epidermal cells on each side of the midrib and the plants are pinnate. In some plants found in Mussoorie by the writer the midrib was very narrow and had only four epidermal cells on each side and the plants were distinctly dichotomous. In some other specimens found by the writer on the Chamba-Pangie road about 10,000 ft. above sea level, the midrib had six or seven cells on each surface and plants showed a tendency to pinnate branching owing to great development of one branch. These variations are interesting as the two characters are generally thought to be constant.

4. *Anthoceros Himalayensis* Kashyap. The plant was described by the writer from Mussoorie (New Phytologist, Vol. XIV. No. 1). The sterile plants were narrow, closely attached to the soil and bore tubers either marginally or ventrally or both. Specimens are found in a place near Simla, under water showed broad thin lobes dividing dichotomously and entirely without tubers. These plants differed from the typical specimens of *A. Himalayensis* so greatly that they could be referred to that species only after some more specimens had been found in a moist place midway between the two above-mentioned forms in habit and bearing embedded tubers.

The effects of Physical and Climatic conditions on the distribution of plants in Mysore Malnad.—By M. K. VENKATA RAO.

Introduction. Literature-abstract. The area comprising the Mysore Malnad.

Physical conditions :—

(1) Variations in elevation. (2) Exposure to sea breeze. (3) Long and narrow valleys. (4) Winding rivers and streams. (5) Evergreen forests. (6) Loose and pervious soil.

Climatic conditions :—

(1) Variations in rainfall. (2) Prolonged drought. (3) Variations in temperature. (4) Fog and humid atmosphere. (5) Heavy winds.

Effects. (a) Direct :—

(1) Reduction in size of leaves. (2) Presence of aromatic oils. (3) Poor quality of timber. (4) Uniformity of distribution and similarity of species. (5) Intense colouration of flowers. (6) Occurrence of Xerophytic vegetation. (b) Indirect :—

(1) Occurrence of forests in patches in protected valleys. (2) Proportionate increase of climbers and epiphytes. (3) Comparative absence of thorny plants. (4) Abundance of Ferns and mosses. (5) Comparative rarity of fresh-water species of algae except Diatoms. (6) Saprophytic fungi and Parasites plants due to decomposing vegetation. (7) Very wide distribution of seeds and fruits.

Conclusion.

Spike Disease of Sandal.—By L. COLEMAN and M. S. NARASIHMAN.

This serious disease of one of the most valuable Indian Forest Products was first noticed near Fraserpet on the Coorg-Mysore frontier in

1899 but was probably in existence for several years prior to that date. Within the past sixteen years about three-fourths of the sandal area in Coorg has become infected. In Mysore it has appeared in most of the sandal areas in Mysore District and in several areas of Hassan and Bangalore Districts. In Madras Presidency it has also appeared in a large number of sandal areas in Salem, Coimbatore and Trichinopoly Districts.

It is difficult to estimate the losses due to the disease but there are indications that sandal to the value of 5 lakhs of rupees are being destroyed annually. If as appears likely the disease continues to spread to areas which have hitherto remained free, sandal as an economic product will practically cease to exist unless we can discover some efficient means of combating the disease.

The chief outward symptoms are (a) a reduction in size of the leaves, (b) shortening of the internodes, (c) disturbance in the growth periodicity leading to growth throughout the year, and (d) death of haustoria and end roots. Inner structural changes are few and unimportant but there is one typical internal symptom, *viz.* the deposition of large quantities of starch in parenchyma of twigs and leaves.

The paper considers the question of starch deposition and shows that there is a disturbance in the translocation indicated by a reduction of diastatic activity in diseased leaves. Whether there is any alteration in the rate of carbohydrate formation in the diseased leaves as compared with healthy ones is under investigation. The fact not heretofore sufficiently emphasized, that leaves showing outward evidence of spike are invariably pale in colour, would point to a decreased carbohydrate formation rather than to an increased one.

The question of the communicability of the disease is discussed and the results of experiments in which twigs from spiked trees were grafted on to healthy trees are given. These show conclusively that the disease is communicable as in a large number of cases the disease was communicated in this way. Injection of an aqueous extract from diseased leaves into healthy trees has, up to the present, given no result.

A number of other plants have been found attacked by diseases showing similar symptoms. In the case of one of these plants, *viz.* *Zizyphus oenopia*, it has been found possible to communicate the disease by grafting just as in the case of sandal spike. The question of the possibility of communicating the disease as it appears in one of the species attached to a healthy plant of another susceptible species is under investigation.

Possible methods of infection in the light of our present knowledge are also discussed in the paper, but our knowledge of the disease is still too incomplete to formulate definite conclusion on this point.

On the Endophytic Nitrogen-fixing Bacteria in *Lemna minor* (L) & *L. polyrrhiza* (L).—By M. O. TIRUNARAYANAN.

Two nitrogen-fixing organisms—*Bacillus radicola* and *Azotobacter*—have been recognised as living inside the tissues of *Lemna*, and also to occur in large numbers on its upper surfaces. In cultures on Mannite Maltose-agar the two kinds of colonies develop and have been indentified as the distinct colonies of these two microorganisms. Both of these bacteria fix atmospheric nitrogen and thrive in nitrogen-free media. In the tissues, they live in association with endophytic *Nostoc*, similar to such associations in *Cycadaceae* and also in *Azolla* and *Anthoceros*. Besides this, the bacteria seem to occur in certain special cells bounding on internal airchambers, which contain a Zooglea of bacteria and are free from nucleus and chloroplasts. But they have not yet been recognised in the tissues of *L. minor*.

On the Nitrogen-fixing Bacteria inside Root-galls caused by
Eel-worms.—By M. O. TIRUNARAYANAN.

Nodules caused by eel-worms, in roots of *Benincasa*, *Momordica* and *Musa* contained bacteria. These were isolated and by the colonies obtained on different media, stabs and streak-cultures, the peculiar motility, staining reactions, and capacity to fix atmospheric nitrogen, have been identified as belonging to the species of *Bacillus radicumicola*. They flourish in nitrogen free-media.

These plants have been healthy. Instead of being harmful, the nematode attack is perhaps beneficial, because, through its agency, there is established an association between these bacteria and the plant, and the plant may profit by the presence of these bacteria in the same way as *Alnus Eleagnus*, &c.

Section of Geology.

President—MR. C. S. MIDDLEMISS, C.I.E., M.A., F.A.S.B.,
Geological Survey of India.

(Presidential Address.)

COMPLEXITIES OF ARCHAEOAN GEOLOGY IN INDIA.

There is no doubt that if one impartially regards the trend of geological theories concerning the oldest rocks, known as the Archaeans, in India, there is apt to arise a feeling of bewilderment. One gets puzzled and perhaps upset by the fertility and versatility in explanation indulged in by geologists when once they give their imagination a free rein in the domain of these very difficult rocks. I am also bound to admit that very much the same sort of bewilderment may readily take possession of one when, instead of theories, one surveys the prime cause of those theories, namely the rocks themselves. The science of geology, alas, does not seem to get any simpler, clearer or more straightforward as it grows older!

Here in Mysore, and one may say in Southern India generally, there are certain aspects of the Archaeans about which a great change of opinion appears to have arisen during the last 12 years or so—as the geology of to-day has gradually unfolded itself from earlier beginnings.

One has but to refer to the beautifully executed geological map of Mysore, on the scale of 1" to 8 miles, recently issued by the Mysore Geological Department, and to the solutions of some of the Archaean problems as concisely presented in the very interesting "Outline of the Geological History of Mysore" by Dr. Smeeth, Director of the Department of Mines and Geology, and which, I believe, is the substance of his address before a previous meeting of this Congress, to recognise that many geological problems, regarded as delightfully simple in the old days of Indian geology, now bear new and startling interpretations, and that some rock terms (or the theoretical conceptions underlying them) have had to be scrapped and cast into the melting pot, to emerge—something quite different.

To be a little more explicit, let me call your attention to the case of rocks known as the Dhárwār system, one of the original homes of which is Mysore. In the earlier days of Indian geology (though not so long ago after all) they were described in modest terms as hornblende and chlorite schists, quartz iron-ore rocks, quartzites, conglomerates, etc., and they were regarded mostly as metamorphosed sediments, or at least as such associated with epidiorites of effusive igneous origin. They were supposed without question to overlie the "fundamental gneiss" and to have

been deposited upon it with an unequivocal unconformity marked by a conspicuous conglomerate at or near the base,—in fact to be younger than that gneiss, to have been folded up on top of it, faulted in places, denuded in places, and so left in their strip-like basins, as presented to our view to-day.

But things have gone apace with the energetic and versatile members of the Mysore Geological Department, and now the main order of rock succession has long ago been implicitly, and more recently formally, reversed; the Dhárwars becoming the oldest rocks in Mysore, whilst for nearly every one of the rock members of that system, including even the limestones, conglomerates, quartz iron-ore schists and lastly the quartzites, an igneous origin of some sort is now seriously championed. If one reads through the Records of the department for the last ten years or so one constantly comes across remarks by Messrs. Wetherell, Slater, Jayaram and others to the above effect. For instance: "The quartzites are probably all of igneous origin and belong to different relative periods of formation, just like the various other acid members of the series" or "From the general evidence obtained it is satisfactorily clear that the true character of these conglomerates is autoclastic and not sedimentary. The most sedimentary-looking grit, arkoses, and fragmental rocks appear to be highly altered lavas and tufaceous deposits and not metamorphosed true sediments."

I might go on quoting in the same strain for some time, but I will content myself with one more example from Dr. Smeeth's "Outline" where, speaking of the quartzites, he says: "Others, entirely quartzose, are occasionally found to exhibit intrusive contacts with adjoining rocks, whilst others of a later date penetrate the subsequent granitic gneiss and even pass from the gneiss into the schists. There can be little doubt that many of these quartzites are crushed and recrystallised quartz veins and quartz-porphyrries and possibly felsites, and it is at least open to question whether we have any which are genuine sedimentary rocks." Whatever outsiders may think as to the reliability of these conclusions, there can be no doubt as to the unanimity with which they have been advocated. Indeed Dr. Smeeth in one of his annual reports appears to be rather tired of the "hornet's nest" that he has raised in the form of the "constant transference of previously imagined sedimentary conglomerates to autoclastic conglomerates" and he sighs for "some one to find a simple satisfactory sedimentary conglomerate with nicely rolled water-worn pebbles"!

Such a revolution of thought, quietly and apparently unanimously undergone, by the members of the Mysore Geological Department, regarding the origin and relative age of these rocks and the series of mineral and physical transformations through which they have gone, must be very disconcerting to the ordinary geological student. It must be extremely perplexing I should think to all who have occasion to refer to the Records and Memoirs of the Department.

To myself, I must own to its being very unacceptable at least in its entirety; for it must be remembered that in the early nineties I spent a considerable time mapping the areas of Salem and Coimbatore, and in association with Mr. F. H. Smith saw something of the Dhárwars as they appear tailing off into long-drawn-out strips and patches in the northern part of these districts. My opinion then formed of those strips and occasional wider patches is expressed in an MS. report written at that time, and I may perhaps quote a portion of this. I then wrote:—

"As regards the interrelations of the Dhárwars with the gneissic system, it is evident that the general appearance of the Dhárwars, their distinctness of texture structure and composition, and the way they lie in continuous bands enfolded among the gneisses, are indications in every way presumptive of the former being the younger formation and that it comes in normal sequence above the gneiss:

although since their formation they have been subjected to earth movements which have acted on them both alike, and caused their present disposition (as indicated by outcrops and foliation dips) to be generally inconclusive one way or the other.

Some few exposures (sections they can hardly be called) are, however, so strongly in favour of the received views concerning this relation that they must be mentioned here. Mr. Smith has described, and I also myself saw, one locality in the valley N.N.W. of Maharajgadi, where a certain flattening out of the Dhárwárs and a bending round of their strike appeared to point to the existence of a slightly shallow synclinal of them upon the gneiss. In another locality a few miles east of Krishnagiri and a little west of Sundanapalli Mr. Smith states that the exposure of the Dhárwárs seems to be that of a rough basin resting on the gneiss though the dips are seen to be much disturbed. Also round about Maradapalli the Dhárwárs are seen to rest directly on the upturned gneiss. Other places visited by myself to the north of Barugur show the same thing—in the usual imperfect way in which sections are exposed in this part of the country. I may instance the hill $1\frac{1}{2}$ miles E. by N. from the Barugur travellers' bungalow, the upper parts of which are all Dhárwárs apparently resting on a platform of the gneiss beneath; and also an exposure north of Neralkotta where a somewhat sudden change from the one rock to the other has all the appearance as of the Dhárwárs lying upon the top of the gneiss.

The search for actual junction sections was, however, for a long time unproductive. At last the little crag on the side of the hill E.N.E. of Barugur, and easily recognised in the distance by its darker colour, yielded such a section: but we were not prepared for the extraordinary nature of the section revealed. It is about 5 yards long, and at the base of it the hornblende biotite gneiss, typical of the Hosur and Krishnagiri plateaux, is seen. Above there are Dhárwárs of the lower-most or epidiorite type, whilst between the two is a zone composed of a matrix of the hornblende-biotite gneiss among which is distributed an irregular assortment of fragments of Dhárwárs. We might describe the arrangement as a zone of the gneiss containing included blocks of the Dhárwárs. The fragments are of all sizes from a few inches across to several feet. They are roughly angular, and many of them are composite blocks, being built up of a number of smaller fragments—the result without doubt of a large block having split up into pieces *in situ*. With everything else in favour of the Dhárwárs being the younger formation, here is an appearance that I think the majority of observers would say showed that the intrusive gneiss was younger than the Dhárwárs!

But before committing ourselves to this last conclusion, let us sum up the arguments for the contrary:—

- (1) The work of the older observers has been held to show that the Dhárwárs are a younger formation resting with complete unconformity and a great conglomerate on the gneisses.
- (2) The Dhárwárs of the Salem District here referred to are directly continuous into those of Kolar, and must certainly be the same.
- (3) The mode of occurrence of the Dhárwárs is as strips among the gneiss, not the reverse. Also there are no veins or veinlets of the gneiss among the Dhárwárs.
- (4) Almost universally in the gneiss there are long trains of similar inclusions at other places where no bulky outcrop of Dhárwárs of sufficient magnitude to be mapped is known; and these trains of inclusions frequently coalesce in one or other direction into unbroken strips in the gneiss of from 1 to 3 feet wide.

Thus the evidence is conflicting. Whilst general conclusions that have great weight are in favour of the younger age of the Dhárwars, the particular section given above might be held to prove just the contrary.

Only, I think, by looking upon the Hosur gneiss as a rock that has passed through (it may be) several vicissitudes of solidification and plutonic remelting without ever having developed much intrusive motion as regards the formations above, can the above conflicting testimony be harmonised."

Such was the somewhat inconclusive view I had of the Dhárwar strips in Salem at that time. I was prepared for a liberal interpretation of the nature of the unconformity at their base, but no suspicion directed against the then received explanation of their sedimentary or sub-aerial origin had entered my thoughts.

Well, gentlemen, the new interpretation of this Dhárwar problem by the Mysore Geological staff has now been before us for some years, and presumably it is being constantly tested on the ground, and in due course the full data in support of it, accompanied by accurate drawings, photographs and detailed plans on an adequate scale will likewise be laid before us and before the geological world. It is a matter of considerable importance that these (especially the drawings and photographs) should be provided, for so far I think I am right in saying that no graphic representation of these extraordinary wholesale transformations of granites quartz-porphyrries and other igneous rock types, into schists, conglomerates, limestones and quartzites, has as yet appeared from the pencil of any of those responsible for the statements. Otherwise I am afraid there will always be a feeling of doubt and questioning in the minds of many.

Meanwhile in this short address it is no part of my desire or intention to question them. Geology is not a science whose results can be settled as by a debating society. I confess, however, that I should very much like to question the rocks themselves, once more again,—to go straight to the fountain-head, so to speak, and help myself to the arguments and facts at first hand—but unfortunately one cannot be in more than one place at a time, and I have other duties to attend to.

It has, nevertheless, occurred to me that, whilst one may perhaps be permitted to suspend judgment as regards these South Indian rocks, until the long awaited data, in full, are kindly vouchsafed us by the Mysore geologists, it might not be amiss to take into consideration certain other areas of Archaean rocks that have recently been under exploration by the Geological Survey of India, and see if they show a similar or different *tendency* in the matter of interpreting the facts discovered. Many of these have come under my own observation, and I have some claim therefore to speak about them at first hand. In the Central Provinces, in Rajputana and in Idar State in Bombay surveys have recently been in progress on Archaean rocks. Of these areas, I have personal knowledge of the last two and particularly of Idar State.

In Idar I have found myself up against a great many difficulties in trying to elucidate the genesis of the wonderfully complex rock systems of the Aravallis and Delhis. Dr. Fermor, Mr. Fox and the late Mr. Burton have similarly had no easy task in the Central Provinces.

As illustrating just one aspect of these difficulties I may perhaps briefly refer to the question of the calcgneisses of those areas. It is a peculiar feature of the rocks of this class in India—whether we consider those of Coimbatore, Vizagapatam, Burma, or the recently explored calcgneisses of the Central Provinces and Idar, that (on the supposition that they are metamorphosed calcareous sediments of some sort) they never show any simple and straightforward passage into unmetamorphosed strata. The converse of this proposition is so generally recognised as true that it hardly requires any remark. It is notorious that all through the great Vindhyan and other old series such as the Cuddapahs and Karnuls

the extremely natural and normal calcareous and other sediments show no passage into anything resembling what are ordinarily known as crystalline limestones, calciphyres and calc-gneisses.

Hence, failing any trace of a sedimentary origin, there have not been wanting efforts to explain the limestone element of these rocks as having been derived, by the action of carbonic acid in solution, from pyroxenic ortho-gneisses, which by assumption are regarded as magmatic. I need only refer to the classical work of Judd and Barrington Brown on the Burma crystalline limestones (Phil. Trans. Roy. Soc., Vol. 187 A, p. 205) and to the earlier interpretations of my colleague Dr. Fermor in the case of the Central Provinces calciphyres (Rec. Geol. Surv. of India, Vol. XXXIII, pp. 168-171). Quite recently, however, both my two colleagues in the Central Provinces, Dr. Fermor and Mr. Burton, have returned to the more simple and straightforward conclusion that not only the calc-gneisses but also the crystalline limestones have been derived from a banded series of calcareous sediments of varying degrees of purity, combined with *lit-par-lit* injection of acid magma. This will be seen from the quotation which I now reproduce from the General Report for the Geol. Surv. of India for the year 1914-15.

"Mr. Burton in his progress report, 1912-13, regards the crystalline limestones as derived from sedimentary limestones of various degrees of purity, and accepts the formation of mica, pyroxene, amphiboles, and chondrodite, as due to the re-crystallisation of the original impurities in the limestone, with pneumatolytic addition of fluorine; but the feldspar in the quartz-pyroxene gneisses he regards as in part of pneumatolytic origin. He thus favours in the main the recrystallisation hypothesis. During the past season's work (1913-14) Mr. Burton had the opportunity of devoting further attention to these calcareous rocks as developed in the Balaghat district. This led to an interesting development of ideas, so that whilst Mr. Burton still supposes that the calc silicate minerals of the calc-gneisses (calc-granulites) were in part derived from original impurities in the calcareous sediments, he lays stress on the fact that the predominant feldspar is microcline with varying amounts of orthoclase, plagioclase being present only in small amount or altogether absent. He deduces that this microcline was derived from the associated orthogneisses during folding, when the latter became refused and attained the condition of an igneous magma containing gases and pneumatolytic agents. The feldspars both of the calc-gneiss and of the ortho-gneiss show quartz inclusions (*quartz de corrosion*), and this, Mr. Burton thinks, indicates that the calc-gneiss and the ortho-gneiss must have crystallised under the same conditions of pressure, indicating that the calc-gneisses are really mixed gneisses which have re-crystallised under plutonic conditions."

In the case of the Idar State examples, I may perhaps be allowed a few words of description, since the observations and data are of my own collecting, and have not been hitherto mentioned from this point of view.

The rocks of this category, there, consist of crystalline limestone and calc-gneiss, of various kinds within certain well-defined limits. The whole set is thoroughly well banded after the manner of any Archaean schist or gneiss, and it is penetrated almost everywhere by a very constant set of lenticles, lenticular bands, branching dykes and occasionally anastomosing granite aplite veins and occasionally by more massive intrusions of biotite-hornblende granite, known as the Idar granite. It is generally roughly equidimensional granular aggregate of frequently large

¹ During the present field season (1914-15) Dr. Fermor has accepted Mr. Burton's idea that these rocks are mixed gneisses and both he (in Chhindwara) and Mr. Burton (in Balaghat) have arrived at the conclusion that the hybridism has, at least in part, been effected by the *lit-par-lit* intrusion of the calcareous rocks by an acid magma. In Chhindwara, however, labradorite is as abundant as microcline in the calc-gneisses.

amounts of calcite, pyroxene (diopside), quartz, orthoclase and microcline with a little plagioclase, biotite and sphene. Occasionally there is a little graphite and pyrite, scapolite, wollastonite, zoisite and minute pale garnet grains (grossularite), with large developments of idocrase (vesuvianite), at one or two places.

These rocks occupy a considerable area in the northern part of Idar, and, though they may merge into another division of the Aravallis, the amphibolite limestones (which I must not stop now to describe) in one direction and into a non-calcareous biotite gneiss in the other, they display no signs anywhere of a passage into unmetamorphosed ordinary limestones, etc.

I would call your attention, however, particularly to two interesting varieties of the calc-gneiss as there developed, one consisting very largely of diopside, wollastonite and sphene and with no free quartz or calcite, and another variety appearing close up against the Idar granite in which great masses of idocrase rock have been developed as a close contact-aureole of that granite. And I would further remark that in another series of Aravalli rocks lying some 8 miles away from the nearest calc-gneiss outcrops, and consisting of a thick series of generally but slightly altered slates, grits, calcareous, siliceous rocks and simple limestones, whose sedimentary origin in my opinion is beyond doubt, I have been able to trace in the proximity of another intrusion of the Idar granite, an exactly similar development of minerals as just referred to, the pyroxene (diopside) and the wollastonite and sphene making up the greater part of the rock in a finely granulitic condition and with large prisms and rounded grains of idocrase. There are many other less salient features of this undoubted sedimentary series that further link it up with the calc-gneiss in an indirect way that I might adduce, but, until the full facts are published, the above may perhaps be accepted as being a very strong argument supporting the theory of the origin of the calc-gneiss by metamorphism of normal impure calcareous sediments which (all interstratified with each other in endless repetition) comprise dark slates, grits, such as are used for grindstones and hones and ordinary soft limestones.

As regards, the calc-gneisses then (being one example of the Archaean complex in Northern India), it is necessary to emphasise the fact that, though they have been a standing puzzle for a long time in India, and though they still offer many attractive problems to work out concerning the serial and particular development of the several minerals, the general tendency of the opinion of workers on them is to regard these rocks as having originated by metamorphism (coupled perhaps with hybridism) from a sedimentary series. I must pass over here the particular, supposed, pneumatolytic influence of the injected granite aplite veins, as accounting for the hybrid features of these very interesting rocks in order briefly to refer to one other aspect of the Idar Archaeans in reference to the great overlying masses of the Delhi Quartzite.

However much one might dispute the sedimentary origin of the Dharwar quartzites, it would be a bold man who would declare the enormous thicknesses and extension of these frequently well-bedded, current bedded and sometimes even ripple-marked quartzites (known all through Rajputana and many other neighbouring districts and states as the Delhi Quartzite) to be anything else than a sedimentary rock—in spite of the fact that it has generally become completely recrystallised.

And yet these rocks, as developed in Idar and as traced into that State by perfectly continuous exposures over an enormous area of country, exhibit the most incongruous relationships to the underlying Aravallis. In their broad aspects they at first suggest an unconformable overlies similar to the proved unconformity seen in more northern sections such as Alwar; but, examined in detail, this is not found to hold, no characteristic synclinal trough arrangement ever manifesting itself, and the ridges and ranges of these rocks possessing plagioclinal strikes as regards the general direction of the ranges and outcrops up against the Aravallis at

their bases. They are frequently extremely sheared and broken up into platy layers near any Aravalli junction, against which they frequently plunge with dips at right angles to the strike of the juxtaposed Aravallis. The whole aspect of the Delhi Quartzite in this area is of enormous ridges, sections and blocks of quartzite strata floundering about as it were in a viscous Aravalli sea. Furthermore there are in certain places actual junctions shown, where stoping of Delhi Quartzite blocks of from one foot or less to several yards in width can be seen as it were in actual operation, and where the whole of these blocks and many also of the half disintegrated basal layers of the Delhi Quartzite have begun to get detached and ready to break away under the stoping operations of the underlying biotite gneiss. And all of these blocks and loosened lower strata, it is important to notice, are in their interstices crowded with many of the typical calc-gneiss minerals, *e. g.* wollastonite, calcite, diopside and grossular garnet—these contact-developed minerals weathering out at the surface of the blocks and leaving a spongy, cavernous layer behind. Chaotic and irregular as is the junction between these two systems in Idar, I am not sure that the parallel arrangement in Ajmer of the same Delhi quartzites to the underlying calc-gneisses (chiefly amphibole epidote gneiss there) does not eclipse it. Last cold weather in the company of my colleague Mr. Heron I had the privilege of seeing near Sendra some of the most amazing relationships between these two formations, which, however, would require diagrams to illustrate them satisfactorily and for which I fear I have not time to trouble you with now, as we have a large number of papers to get through this morning.

Before concluding, I should say that the impressions I have gathered in Idar with regard to these and other phenomena are on the whole in favour of calling largely on the processes known as plastic deformation and dynamometamorphism for an explanation of very many of these peculiar results. I am inclined to picture to myself that below a certain level underground, such as may well have now been exposed by uplift and denudation in the roots of this old Aravalli mountain chain, processes of the above category may well have brought about in the Delhi Quartzite, in the Aravallis below, or along the junction line between them, very great and powerful metamorphosing actions that have simulated magmatic stoping and assimilation, that have probably reduced much rock in certain areas to the condition of aqueo-igneously fused rock-pulp, and that have culminated in the production of gneisses. It is even allowable to suppose that they may also have caused the inception among them of intercrustal veins, lenticles and dykes of aplite and other pegmatitic variants, after the manner advocated by A. C. Lane, quoted in Daly's "Igneous Rocks and their Origin," p. 370, and named by him "selective solution." In that reference it is said that: "During intense regional metamorphism, specially of the dynamic kind, deep-seated rocks, charged with much interstitial water, may reach the relatively low temperature at which minerals corresponding to the quartz-felspar eutectic go into solution with the water and other volatile fluxes. Such small, locally generated pockets, lenses or tongues of fluid may be driven through the solid country rock for an indefinite distance; subsequently to crystallise with the composition and habit of the true batholithic derivatives. It is thus quite possible that these particular rocks, though truly magmatic, have had no direct connection with abyssal injections."

In other words, it seems to me that from what may once have been two unconformable systems, such as the Delhis above and the Aravallis below, one may have had generated by plastic deformation and dynamic metamorphism the appearance of a complete eruptive unconformity, separating a lower gneissic from an upper quartzite series. And if that be granted, then it is obvious that the great march of events here in these northern rock areas can only be understood as being the exact reverse of that which the Mysore Geological Department are advocating in the case of the not dissimilar position in Southern India.

I do not propose to go further than this, and it is certainly not my intention in any way to suggest that the Mysore Department should immediately proceed to revise their conceptions regarding the origin of the rocks of their own extremely interesting country; but I do urge that all the *pros* and *cons* in the case should be very carefully and patiently considered, as I have no doubt that they certainly will be.

Chamberlin and Salisbury have written as follows in their *Geology*, p. 429 (1905), under the heading of "Completion of the Rock Cycle":—

"The crystallising processes of metamorphism are fundamentally similar to the processes by which rocks crystallise out of magmas, only in the first case the work is done chiefly by the aid of an aqueous solution, while in the second it is done through the mutual solution of the constituents in themselves where water was but an incident. If the heat factor in metamorphism be sufficiently increased, aqueous solution may actually grade into magmatic solution through various degrees of softening and melting, and the cycle of changes be closed in upon itself."

Consequently, it seems to me, that in dealing with any rock that appears to be of doubtful igneous or magmatic origin, it is above all necessary in these days to ascertain in which direction the cycle of change is moving. To put the matter bluntly—an apparent ortho-gneiss with its contemporaneous veins may quite as well be an intensely metamorphosed sediment with pegmatites formed in it by 'selective solution' as it may be the extreme, foliated or otherwise modified, representative of a granitic, gabbroid or hybrid abyssal injection.

Notes on the Origin of the Living Molluscan Fauna of the Indian Ocean, with reference to Former Geological Times.

—By E. VREDENBURG.

The object of this paper is to show that most of the genera and species characteristic of the Indian or Indo-Pacific region at the present day have originated in that same region in former geological times; and that, in previous geological periods, the fauna of the Indo-Pacific region differed from that of the Atlantic and Mediterranean very much in the same manner as it does at the present day. It also shows that during certain intermittent periods of wider marine extension, when there was a more direct communication between the Indian and Atlantic regions than exists at present, there were *some* exchanges between the two faunas, but that there is no evidence of any important migration either in one direction or the other: the slight dilution of one fauna with the other being quite insufficient to obscure the well-marked faunistic differences of the two regions.

A preliminary note on the Origin of Wolfram-bearing Quartz Lodes in Tavoy District, Lower Burma.—By J. COGGIN BROWN.

These notes are tentative results obtained up to the present time, and the author invites criticism of other workers on similar deposits. The wolfram deposits have been proved to originate from quartz lodes connected by pegmatites, aplites, etc., with granite masses penetrating the ancient sedimentary series known as the Mergui series. The granite occasionally contains tinstone and molybdenite, and the pegmatite dykes and quartz veins contain tungsten, tin, molybdenum, bismuth, iron, copper, arsenic, lead and zinc minerals.

The author criticises adversely Dr. Bleek's theory concerning the wolfram and tin lodes of Tavoy, especially as to the presence of a distinct "mineral zone," a wolframite-cassiterite-columbite zone and the presence

of tourmaline introduced by pneumatolitic processes from the intrusive granite. The author also gives other arguments illustrating the magmatic segregation theory—pegmatitic or aplitic—of the formation of the lodes, as contrasted with the theory of Bleek of their formation by mineral solutions and pneumatolysis. In the case of the wolfram and cassiterite quartz veins, of which the pegmatitic origin is not so clear, it seems reasonable to regard them as a hydro-thermal phase of pegmatites.

A Revised Classification of the Gondwana System.—By
G. DE P. COTTER.

An attempt is made in this paper to sub-divide the Gondwana System into series and stages on the lines laid down by the International Congress of Geology, and to determine the European equivalents of each stage. The Maleri stage has been separated from the Kota stage; the former has been placed in the Trias, while the latter remains in the Oolitic. Evidence is brought forward to show that the Panchet stage of Raniganj is lower Trias. The upper Trias is represented by the Maleri stage, and the Rhaetic by the *Thinnfeldia odontopteroides* beds of South Rewah, to which a new stage name, the Parsora stage, is given. The Damuda series are shown to be Permian, and not partly Trias, as Koken supposed. The relationships of the Maleri to the Parsora stage are doubtful: the author paid a visit to South Rewah to determine which was stratigraphically above the other, but no definite conclusion was arrived at. He suggests, however, that the Parsora stage is very possibly the upper of the two. The Umia stage is no longer placed in the upper Jurassic, but in the lower Cretaceous, in accordance with the work of Kitchen.

An account of the Sub-division of the Deccan Trap Series in the neighbourhood of Narayanganj, Mandala District, Central Provinces.—By K. A. K. HALLOWES.

The author, in continuation of the work of Fermor and Fox in the Chhindwara District, gives a short account of his sub-division of the Deccan Traps in Mandala District. The separation of the boundaries of particular flows was principally effected by the aid of vesicular surfaces, green-earth horizons, intertrappean limestone and chert and by the terraces due to the above. Eight different flows have thus been distinguished, which also are found to possess minor differences of texture and composition; all of them being either basalts or dolerites with varying amounts of olivine, serpentine, chlorophaeite and palagonite in addition to the ordinary minerals of the Deccan Trap. He discusses the origin of some of the palagonite, the varying specific gravities of the flows, their silica content and their other physical characteristics.

On the application of Cochineal Stain on Calcite, and Aragonite.—By S. DATTA.

The author details a further set of experiments in continuation of those described by him in a paper before the Indian Association for the Cultivation of Science in September 1916, on the staining of these same minerals by means of aniline black, as a means of distinguishing them.

On the Occurrence of Limburgite in British Baluchistan.—By
H. DAS GUPTA.

The author describes a limburgite from the Deccan Trap of Baluchistan, characterised by a smaller amount of the phenocrysts of olivine as

compared with those of augite, and the presence of felspar microlites in the groundmass. $\text{SiO}_2=40.73$ per cent. According to the "Quantitative Classification" the position of the rock is III. 6. 4. 4, and the term *Hamandunose* has been proposed for the subrang. The presence of felspar in the groundmass is discussed and it is suggested that a very large section of the rocks now known as limburgites is very closely allied to the picrites.

Corundum and its Occurrence in Mysore.—By L. SUBBA RAO.

After a brief reference to the origin of the word *corundum*, the author proceeds to describe the economic value of the mineral and states that, though corundum is the richest and purest of the ores of aluminium, the cost of the mineral compared with that of Bauxite presents a real difficulty in the way of using the former for the manufacture of the metal. The paper then goes on to describe the crystalline form of the mineral. Three twinned crystals are described as specially deserving of mention. Two of them are of the cruciform type and the third represents prism of the second order and rhombohedron combined on the prism of the first order as the composition plane, the twin thus giving rise to a curious monoclinic appearance. The paper then refers to certain samples of corundum occurring at Kupya and Doddrei in Mysore where this mineral, which is generally considered unalterable, is found to be surrounded by a greenish material which the author makes out to be *margarite*. The author discusses the nature of this alteration and cites Professor Judd's statement that conditions must exist in the earth's interior under which chemical change of this mineral does take place. The paper next proceeds to a consideration of emery and its occurrence in Mysore. After stating that mineralogically emery is simply a mixture of corundum and magnetite and that its value as an abrading agent depends upon the proportion of the former constituent, the author mentions a locality in Mysore where corundum crystals are found enclosing grains of magnetite arranged in peculiar patterns as stellate figures, etc. and gives it as his opinion that such occurrences are to be considered as merely instances of emery.

The paper concludes with a short note on the origin of corundum and states that its occurrence in Mysore well illustrates the processes of segregation and metamorphism. In many cases, says the author, it is of undoubtedly metamorphic origin and in others it is the direct result, in place, of basic igneous masses. According to the author, the corundum in Mysore Province can be divided into two main groups:—(1) those in which corundum is associated with basic rocks intruding into the surrounding gneisses and (2) those in which it is associated with acid rocks intruding into the older amphibolites; and examples are given from Mysore Province to illustrate each type of occurrence.

Lectures.

Three public lectures were delivered:—

"The Sun".—By C. MICHIE SMITH, Esq., C.I.E., B.Sc.

"Soaring Flight".—By Dr. E. H. HANKIN.

"Explosives".—By F. L. USHER, Esq., B.Sc.

On the opening day there was a general discussion on "Scientific Libraries in India" with Colonel Sir Sydney Burrard, K.C.S.I., R.E., F.R.S., in the chair, whilst on the last afternoon there was a discussion on "The Future of the Indian Science Congress" presided over by the President.

LIST OF MEMBERS, INDIAN SCIENCE CONGRESS, 1917.

A

- Mr. D. Ananda Rao, Agricultural College, Coimbatore.
- *Mr. L. K. Anantakrishna Iyer, the State Museum, Trichur.
- Mr. C. S. Anantapadmannaba Rau, Teachers' College, Saidapet.
- *Dr. N. Annandale, Indian Museum, Calcutta.
- Mr. H. E. Annett, Agricultural College, Cawnpore.
- Mr. R. D. Anstead, 2, Cambridge Road, Bangalore
- Mr. V. Appa Rau, Government College, Rajamundry.
- Dr. P. S. Achyuta Rau, Bangalore.
- Mr. G. N. Annaiya, Central College, Bangalore.

B

- Mr. D. Balakrishna Murti, Dept. of Agriculture, Anakapalli.
- Mr. P. R. Balakrishnan, Central College, Bangalore.
- *Dr. C. A. Barber, the Agricultural College, Coimbatore.
- Mr. J. H. Barnes, the Agricultural Dept., Lyallpur.
- Mr. D. R. Bhattacharya, Muir Central College, Allahabad.
- Mr. K. Bihma Rau, Agricultural Dept., Bangalore.
- Mr. S. K. Bhose, Indian Institute of Science, Bangalore.
- *Sir Alfred G. Bourne, F.R.S., Indian Institute of Science, Hebbal, Bangalore District.
- Lady Bourne, Indian Institute of Science, Hebbal, Bangalore Dist.
- Mr. J. Coggin Brown, Geological Survey of India, Calcutta.
- *Dr. W. Burns, College of Agriculture, Poona.
- *Colonel Sir Sydney G. Burrard, F.R.S., Dehra Dun.
- Mr. B. Balaji Rau, Central College, Bangalore.

C

- *Mr. C. C. Calder, Royal Botanical Gardens, Sibpur, Calcutta.
- Dewan Bahadur J. S. Chakravari, Jnanalaya, Bangalore.
- Mr. S. C. Chatterji, Cotton College, Assam.

- Dr. B. L. Chaudhuri, Indian Museum, Calcutta.
- Mr. C. P. Chowna, Indian Institute of Science, Bangalore.
- Major G. Clarke, San Thome, Madras.
- Mr. D. Clouston, Nagpur.
- Dr. L. Coleman, Dept. of Agriculture, Bangalore.
- Mrs. L. Coleman, Bangalore.
- Miss Coleman, Bangalore.
- Mr. H. M. A. Cooke, Oorgaum, Kolar Gold Fields.
- Lt.-Col. J. W. Cornwall, I.M.S., Pasteur Institute, Coonoor.
- Mr. G. de P. Cotter, Geological Survey of India, Calcutta.
- Col. Lennox Conyngham, R.E., Dehra Dun.
- Mrs. Lennox Conyngham, Dehra Dun.
- Miss Conyngham, Dehra Dun.

D

- Mr. A. B. Das, City College, Calcutta.
- Mr. B. Dasancharia, 40, Clive House, Teppakulam, Trichinopoly.
- *Dr. R. L. Datta, Presidency College, Calcutta.
- Mr. W. A. Davis, Research Institute, Pusa.
- *Lt.-Col. Donovan, Dunduan, Nungumbaukum, Madras.
- Mr. C. Driberg, Infantry Road, Bangalore.
- Mr. B. Dwarkanath, Chemical Examiner's Office, Agra.
- Mr. K. S. Dhiranda Doss, Indian Institute of Science, Bangalore.
- Mr. S. V. Dhebar, the Distillery, Bangalore.
- Mr. B. Dasappa, Bangalore.
- Dr. B. B. Dey, Presidency College, Calcutta.

E

- *Mr. T. Ekambaram, Presidency College, Madras.

F

- Mr. R. S. Finlow, Calcutta.
- Mr. C. Fischer, Forest College, Coimbatore.

Dr. G. J. Fowler, Indian Institute of Science, Hebbal, Bangalore.
Mr. G. N. Frattini, West End Hotel, Bangalore.

*Mr. P. F. Fyson, Presidency College, Madras.

G

Mr. M. J. Gajjar, Girgaum Chemical Laboratory, Bombay.

Mr. A. Ghose, Gooty.

Mr. M. Gopala Rau, Presidency College, Madras.

Dr. F. H. Graveley, Indian Museum, Calcutta.

Mr. V. Govindan, Fisheries Bureau, Calicut.

Mr. A. G. Ghokale, Indian Institute of Science, Bangalore.

Mr. V. S. Ghurza, Bahauddin College, Junagadh, Kathiawar.

Mr. K. M. Guraraya, Agricultural Inspector, Hebbal, Bangalore.

H

Rev. Father A. Haas, St. Joseph's College, Trichinopoly.

Rev. Father D. Honoré, St. Joseph's College, Trichinopoly.

Dr. E. H. Hankin, Govt. Analyst, Agra.

Mr. F. Hannyngham, Mercara, Coorg.

Dr. W. H. Harrison, Agricultural College, Coimbatore.

*Dr. H. H. Hayden, F.R.S., Geological Survey, Calcutta.

Mr. R. S. Hole, Forest Research Institute, Dehra Dun.

Mrs. Hole, Forest Research Institute, Dehra Dun.

*Mr. J. Hornell, Fisheries Bureau, Tuticorin.

*Mr. A. Howard, Agricultural Research Institute, Pusa.

Mrs. Howard, Agricultural Research Institute, Pusa.

Miss Hunter, Indian Institute of Science, Hebbal, Bangalore.

*Mr. J. de Graaf Hunter, Dehra Dun.

Dr. A. Hay, Indian Institute of Science, Hebbal, Bangalore.

Mrs. Hay, Indian Institute of Science, Hebbal, Bangalore.

Mr. Habib Hassan, Indian Institute of Science, Hebbal, Bangalore.

Mr. Mahdi Hassan, Indian Institute of Science, Hebbal, Bangalore.

J

*Mr. V. H. Jackson, Govt. College, Patna.

Mr. K. C. Jacob, Agricultural College, Coimbatore.

Mr. P. S. Jivanna Rao, Agricultural College, Coimbatore.

Mr. R. L. Jones, the Observatory, Madras.

K

Mr. P. B. Kale, Indian Institute of Science, Hebbal, Bangalore.

Mr. D. D. Kanga, Elphinstone College, Bombay.

Mr. S. R. Kashyap, Govt. College, Lahore.

*Mr. S. W. Kemp, Indian Museum, Calcutta.

Mr. P. Kodanda Rao, Y.M.C.A., Bangalore.

Mr. H. V. Krishnayya, Dept. of Agriculture, Bangalore.

Mr. V. S. Krishna Iyer, Scott Christian College, Nagercoil.

Mr. K. Krishna Murti Rao, Agricultural College, Coimbatore.

Mr. K. Kunhi Kannan, Dept. of Agriculture, Bangalore.

Mr. G. S. Kurunpad, Dept. of Agriculture, Bangalore.

Mr. K. S. Karpar, Mallaveswaram, Bangalore.

Mr. A. Krishnappa, Maharajah's Collegiate School, Mysore.

Mr. R. Krishna Iyengar, Maharajah's Collegiate School, Mysore.

L

Mr. R. Littlehailes, the Observatory, Madras.

M

Mr. P. S. McMahon, 68, St. John's Mall, London, England.

*Mr. J. Mackenna, the Research Institute, Pusa.

*Rev. Dr. D. Mackichan, Wilson College, Bombay.

Mr. W. McRae, Agricultural College, Coimbatore.

Mr. K. B. Madhava, 1-11, Singachari St., Triplicane, Madras.

*Dr. D. N. Mallik, Presidency College, Calcutta.

*Dr. H. H. Mann, College of Agriculture, Poona.

Mr. D. B. Meek, Dacca College, Dacca.

*Mr. R. D. Mehta, 9, Rainey Park, Ballygunj, Calcutta.

Dr. A. N. Meldrum, College of Science, Ahmedabad.

Mr. E. P. Metcalfe, Niton, Palace Rd., Bangalore.

*Mr. C. S. Middlemiss, Geological Survey, Calcutta.

*Sir R. N. Mukerjee, 7, Harrington St., Calcutta.

Mr. I. Mrityunjayudu, Maharajah's College, Vizianagram.

Mr. M. N. Mukherji, Muir College, Allahabad.

Sir A. McRobert, Cawnpore.

Mr. D. N. Mutyala, Indian Institute of Science, Bangalore.

Mr. G. A. Mahamati, Indian Institute of Science, Bangalore.

N

Dr. T. M. Nair, Vepery, Madras.

*Mr. H. V. Nanjundayya, Mysore City.

Mr. V. Narabari Rao, Central College, Bangalore.

Mr. M. J. Narasimhan, Maharajah's College, Vizianagram.

Mr. A. L. Narayana, Maharajah's College, Vizianagram.

Mr. A. K. Y. Narayana Iyer, Agricultural Dept., Bangalore.

Mr. K. A. Narayana Rao, Hebbal Farm, Bangalore.

Mr. C. R. Narayan Rao, Central College, Bangalore.

Mr. H. Narayan Rao, Presidency College, Madras.

Mr. C. S. Narayanaswami Iyer, 191, Mount Rd., Madras

Mr. S. S. Nehru, Azamgarh, U.P.

*Mr. P. Neogi, Govt. College, Rajshahi, Bengal.

Mr. C. Noronha, Agricultural Dept., Bangalore.

Mr. K. K. Nanvarti, Indian Institute of Science, Bangalore.

Mr. F. T. Newland, Poonamalee Rd., Madras.

Mr. U. V. Narasihmaswami, the Maharajah's College, Vizianagram.

O

Mr. C. J. O'Callaghan, Board of Revenue, Madras.

P

Mr. M. V. Pant Vaidya, Indian Institute of Science, Bangalore.

Mr. H. Parameswaran, 161, Victoria Hostel, Triplicane, Madras.

Mr. G. R. Paranjpe, Indian Institute of Science, Bangalore.

Mr. F. R. Parnell, Agricultural College, Coimbatore.

Mr. K. Parthasarathi Iyengar, Sandalwood Oil Factory, Bangalore.

*Mr. M. Parthasarathi Iyengar, Teachers' College, Saidapet, Madras.

Mr. R. S. Pearson, The Palms, Rajpur Rd., Dehra Dun.

Mr. P. J. Pocock, Nizamiah Observatory, Begumpet, Deccan.

Mr. K. P. Puttanna Chetty, Bangalore.

Mr. M. S. Puttanna, Basavangudi, Bangalore.

Mr. N. Prasad, Agricultural College, Pusa.

Mr. Jote Parshad, Geological Office, Kashmir.

R

Mr. P. Raghvendra Rao, Crescent Rd., Bangalore.

Mr. M. Raja Rao, Govt. High School, Bangalore.

Mr. M. R. Raja Rao, Indian Institute of Science, Bangalore.

Mr. T. R. Raghunatha Rao, Rajah's College, Parlakimedi.

Mr. L. S. Raju, Lakshmivasam, Basavangudi, Bangalore.

*Mr. J. N. Rakshit, Opium Factory, Ghazipur

Mr. D. G. Ramchandra Rao, Agricultural Dept., Shimoga

Mr. G. Ramachandra Rao, Agricultural College, Coimbatore.

*Mr. C. V. Raman, 1/5 IB Premchand Bural St., Calcutta.

Mr. K. R. Ramanathan, Maharajah's College, Trivandrum.

Mr. K. Bamaiah, Agricultural College, Coimbatore.

Mr. M. R. Ramaswami Sivan, Agricultural College, Coimbatore.

*Mr. K. Ramunni Menon, Presidency College, Madras.

*Rao Bahadur K. Ranga Achari, Agricultural College, Coimbatore.

Mr. G. N. Rangaswami Iyengar, Agricultural College, Coimbatore.

Mr. V. Rangaswami Iyengar, Avenue Rd., Bangalore. [City.

Mr. M. Jelal Rasheed, Bangalore

*Dr. P. C. Ray, University College of Science, Calcutta

Dr. T. Royds, the Observatory, Kodaikanal.

Mrs. Royds, the Observatory,
Kodaikanal.
Mr. T. R. Rajaraman, Patanbaha-
ban, Bangalore.
Mr. B. S. Raghavandra Rao, Maha-
rajah's Collegiate High School,
Mysore.
Mr. R. Ramachandra Rao, Mecha-
nical Engineering School, Banga-
lore.
Mr. Y. V. Ramayya, the Maha-
rajah's College, Vizianagram.

S

Mr. N. Sampatiyengar, Agricul-
tural Dept., Bangalore.
Mr. P. Sampatiyengar, Geological
Dept., Bangalore.
Mr. B. Sanjiva Rao, Central Col-
lege, Bangalore.
Mr. B. Sankan Rao, Dept. of Agri-
culture, Bangalore.
Mr. B. K. Sanyal, Institute of
Science, Bangalore.
Mr. V. N. Sarangdhar, Wilson Col-
lege, Bombay.
Mr. A. M. Sen, Geological Dept.,
Bangalore.
Mr. M. Seshaiyengar, Central Col-
lege, Bangalore.
Mr. R. Seshayee, Comerford House,
Trichinopoly.
Mr. P. V. Seshnajar, Central Col-
lege, Bangalore.
Mr. P. V. Seshu Iyer, Presidency
College, Madras.
Mr. A. Setlur, Geological Dept.,
Bangalore.
*Dr. J. L. Simonsen, Presidency
College, Madras.
Mrs. Simonsen, Presidency College,
Madras.
Mr. B. K. Singh, Dacca College,
Dacca.
Dr. A. Sircar, Muir Central College,
Allahabad.
Mr. A. Michie Smith, Winsford,
Kodaikanal.
Mr. P. Bosworth Smith, Kolar
Gold Fields, Oorgaum.
*Mr. T. Southwell, Fisheries Dept.,
Calcutta.
Mr. C. Srikantia, Central College,
Bangalore.
Mr. G. A. D. Stuart, Dept. of Agri-
culture, Madras.
Mr. A. Subba Rau, Central College,
Bangalore.
Mr. L. Subba Rau, 5th Cross St.,
Shankerpura, Bangalore

Mr. T. V. Subramanya Iyer, Dept.
of Agriculture Bangalore
Mr. V. Subramanya Iyer, Ring-
wood, Bangalore.
Dr. J. J. Sudborough, Indian
Institute of Science, Hebbal,
Bangalore.
Mr. B. Sundara Raj, Fisheries
Bureau, Madras.
Mr. K. Suryanarayana, Mission
College, Guntur
Rao Bahadur M. Shama Rao,
Bangalore.
Mr. K. S. Srinivasan, Presidency
College, Madras.
Mr. R. U. Sundaran Iyer, P. W. D.,
Bangalore.
Mr. K. Srinivasan, Mallesuwaran,
Bangalore.
Mr. C. Srikantavaru Iyengar,
Inspector General of Police,
Bangalore.
Mr. V. S. Sambasiva Iyer, Central
College, Bangalore.

T

Mr. C. H. Tacchela, Indian Insti-
tute of Science, Bangalore.
Mr. M. O. Tirunarayanan, 36, Park
Square, Triplicane, Madras.
Col. T. F. Renny Tailyour, B.U.S.
Club, Bangalore.
Mr. R. Thomas, Agricultural Dept.,
Madras.
Mr. M. W. Thonipsur, Kurnool.

U

Mr. F. L. Usher, 2, Cunningham
Rd., Bangalore.
Mrs. Usher, 2, Cunningham Rd.,
Bangalore.
Mr. K. Umanatha Rao, Indian
Institute of Science, Bangalore.

V

Mr. B. Venkatanaranappa, Central
Coll. ge, Bangalore.
Mr. B. Venkatarangiyengar, Sandal
Wood Factory, Bangalore.
Mr. C. K. Venkata Rao, 6, Singa-
rachari St., Triplicane, Madras.
Mr. K. B. Venkata Rao, Agricul-
tural School, Hebbal, Bangalore.
Mr. M. K. Venkata Rao, Agricul-
tural Dept., Bangalore.
Mr. T. V. Venkataraman, Agricul-
tural College, Coimbatore.
Mr. B. Venkatesachar, Central Col-
lege, Bangalore.

Mr. N. Venkatesa Iyengar, the
Observatory, Bangalore.

Mr. R. Venkatesawaran, Central
College, Bangalore.

Mr. B. Venkoba Rao, Champion
Reef, Kolar.

Mr. B. Visvanathan, Agricultural
College, Coimbatore.

Mr. E. Vredenburg, Geological Sur-
vey, Calcutta.

Mr. N. Venkatarama Iyengar,
Indian Institute of Science,
Bangalore.

Mr. S. R. Venkata Krishna, Agri-
cultural College, Coimbatore.

W

*Dr. G. T. Walker, F.R.S., Me-
teorological Department, Simla.

Mrs. Walker, Meteorological Dept.,
Simla.

Mr. W. G. P. Wall, Oak Ridge,
Naini Tal.

*Dr. H. E. Watson, Indian Insti-
tute of Science, Bangalore.

Mr. A. K. Wernigg, Indian Insti-
tute of Science, Bangalore.

Mrs. Wernigg, Indian Institute of
Science, Bangalore.

Mr. H. C. Wilson, Fisheries Bureau,
Madras

Mr. C. Wood, Agricultural College,
Coimbatore.

*Dr. W. N. F. Woodland, Muir
Central College, Allahabad.

Mr. V. D. Wad, Indian Institute of
Science, Bangalore.



MARCH, 1917.

The Monthly General Meeting of the Society was held on Wednesday, the 7th March, 1917 at 9-15 P.M.

H. H. HAYDEN, Esq., C.I.E., D.Sc., B.A., B.A.I., F.G.S., F.A.S.B., F.R.S., President, in the chair.

The following members were present :—

Rev. H. Basdekas., Dr. B. L. Chaudhuri, Miss M. L. Cleghorn, Mr. H. G. Graves, Dr. W. C. Hossack, Mr. S. W. Kemp, Mr. R. D. Mehta, C.I.E., Dr. Satis Chandra Vidya-bhusana.

Visitors :—Mr. C. Cleghorn, Mr. K. C. Ghose.

The minutes of the January Ordinary Monthly Meeting, the Annual Meeting and the February Ordinary Monthly Meeting were read and confirmed.

Sixty-four presentations were announced.

The Chairman announced that in accordance with Rule 38 of the Society's Rules, the names of the following six members had been posted up as defaulting members since the last meeting, and their names have now been removed from the member list :—

Maulavi Aminulla, Ghazipur.
Babu Debendra Kumar Banerjee, Dacca.
C. H. Hutchinson, Esq., Pusa.
S. M. Jacob, Esq., I.C.S., Bombay.
Babu Munan Dube, Domardagunj.
Babu Lachmi Narain Singh, Bankipur.

The General Secretary read the names of the following gentlemen who were appointed to serve on the various Committees during 1917.

Finance Committee.

Dr. N. Annandale, Mahamahopadhyaya Haraprasad Shastri, C.I.E., Mahamahopadhyaya Satis Chandra Vidya-bhusana, Honorary Librarian (*ex officio*).

Library Committee.

Mahamahopadhyaya Haraprasad Shastri, C.I.E., Mr. J. A. Chapman, Father H. Hosten, Major D. McCay, I.M.S., Mr. S. W. Kemp, Honorary Librarian (*ex officio*, Library Regulation 22),

Anthropological Secretary, Biological Secretary, Physical Science Secretary, the two Philological Secretaries, Medical Secretary.

Philological Committee.

The Hon. Dr. Abdulla Al-Ma'mun Suhrawardy, Dr. Satis Chandra Vidyabhusana, The Hon. Justice Sir Asutosh Mukhopadhyaya, Kt., Mahamahopadhyaya Haraprasad Shastri, C.I.E., Rai Monmohan Chakravarti, Babu Rakhal Das Banerji, Babu Nilmani Chakravarti, Mr. A. H. Harley, Aga Muhammad Kazim Shirazi, Mr. O. F. Jenkins.

Hon. Numismatist.

Mr. H. Nelson Wright, I.C.S., Mr. H. Nevill, I.C.S. (Officiating).

Hon. Joint Secretaries, Science Congress.

Dr. J. L. Simonsen.

Prof. P. S. Macmahon.

The following gentlemen were balloted for as Ordinary members :—

The Rev. R. P. Newton, M.A., Chaplain, Bengal Ecclesiastical Establishment, Dinapur, proposed by the Venerable W. R. Firminger, seconded by Mr. R. D. Mehta, C.I.E.; *Kazi Dousamdup*, Head Master B. B. School, Gangtok, Sikkim, proposed by Mr. C. A. Bell, seconded by Maulavi Abdul Wali.

The following papers were read :—

1. *A Revision of the Lizards of the Genus Tachydromus.*
—By Dr. G. A. BOULENGER.

This paper will be published in the *Memoirs*.

2. *Riddles Current in the District of Sylhet in Eastern Bengal.*—By SARAT CHANDRA MITRA. Communicated by the Anthropological Secretary.

This paper has been published in the *Journal*.

3. *Zoological Results of a Tour in the Far East.—Aquatic Oligochaeta from Japan and China.*—By J. STEPHENSON, D.Sc.

4. *Zoological Results of a Tour in the Far East.—Hydrozoa and Ctenophora.*—By N. ANNANDALE.

These two papers have been published in the *Memoirs*.

The President announced that there would be no meeting of the Medical Section this month.

APRIL, 1917.

The Monthly General Meeting of the Society was held on Wednesday, the 4th April, 1917, at 9-15 P.M.

H. HAYDEN, Esq., C.I.E., D.Sc., B.A., B.A.I., F.G.S., F.A.S.B., F.R.S., President, in the chair.

The following members were present :—

Dr. F. H. Gravely, Mr. H. G. Graves, Mr. C. W. Gurner, Dr. W. C. Hossack, Dr. Satis Chandra Vidyabhusana, Mr. E. Vredenburg.

Visitors :—Babu Dinesh Chandra Bhattacharjya, Dr. A. Meerwarth.

The minutes of the last meeting were read and confirmed.

Thirteen presentations were announced.

The General Secretary reported that Dewan Bahadur Hiralal Basu and Dr. Birendra Nath Ghose had expressed a desire to withdraw from the Society.

The following gentlemen were balloted for as Ordinary Members :—

Mr. P. H. Awati, M.A., Medical Entomologist, Central Research Institute, Kasauli, proposed by Dr. B. L. Chaudhuri, seconded by Babu Gopal Das Chowdhuri; *Mr. Abdul Majid*, B.A., M.R.A.S., Gola Gunj, Lucknow, proposed by Syed Naseer Hosien Khan Khayal, seconded by Aga Muhammad Kazim Shirazi; *Dr. Rasik Lal Datta*, D.Sc., Lecturer in Chemistry, Presidency College, Calcutta, 78, Manicktola Street, Calcutta, proposed by The Hon. Justice Sir Asutosh Mukhopadhyaya, Kt., seconded by Dr. P. C. Ray, C.I.E.

The following gentleman was proposed as an Honorary Fellow :—

Professor Herbert A. Giles, I.L.D., Prof. of Chinese in the University of Cambridge, Cambridge, England.

Dr. Herbert Allen Giles, Honorary LL.D. (Aberdeen) 1897, Honorary M.A. (Cantab) 1898, succeeded the late Sir Thomas Wade as Professor of Chinese in the University of Cambridge in 1897. He stands in the foremost rank of scholars who have devoted themselves to the investigation of Chinese History and Literature. His Chinese-English Dictionary was published in 1892, and a second edition was issued in 1912. His Chinese Biographical Dictionary obtained the Prix St. Julien of the Academie Française in 1897. In 1902, he was nominated the first lecturer on the Dean Lung Foundation in the Columbia

University; his lectures were subsequently published under the name of "China and the Chinese." Amongst his other publications may be mentioned Records of Buddhistic Kingdoms (1877), Glossary of Reference (which, first published in 1878, reached a third edition in 1900), Gems of Chinese Literature (1884), Remains of Lao Tzu (1886), Chinese Poetry in English Verse (1898), History of Chinese Literature (1901), History of Chinese Art (1905), Religions of Ancient Chinese (1905), Chinese Fairy Tales (1911), and Civilisation of China (1911). He has issued several works with a view to popularise the study of Chinese Language; amongst these, may be noted Chinese without a teacher (which, first published in 1872, reached a sixth edition in 1908); Colloquial Idioms (1873); Hand Book of the Swatow Dialect (1877); and Elementary Chinese (which, first published in 1900, reached a second edition in 1910). He joined the Chinese Consular Service in 1867 and till he resigned in 1893 held Office as Vice-Consul and Consul in many important places; he has had consequently exceptional opportunities of first-hand study of Chinese Language, Literature, Philosophy and Art.

The following papers were read :—

1. *Bhasa and his alleged works.*—By DINESH CHANDRA BHATTACHARYYA, M.A. Communicated by the Joint Philological Secretary.

2. *A Progress Report on the work done during the year 1916 in connection with the Bardic and Historical Survey of Rajputana.*—By DR. L. P. TESSITORI.

The latter paper has been published in the *Journal*.

The President announced that there would be no meeting of the Medical Section during this month.

MAY, 1917.

The Monthly General Meeting of the Society was held on Wednesday, the 2nd May, 1917, at 9-15 P.M.

H. H. HAYDEN, Esq., C.I.E., D.Sc., F.R.S., B.A., B.A.I., F.G.S., F.A.S.B., President, in the chair.

The following members were present :—

Maulavi Abdul Wali, Dr. N. Annandale, Dr. B. L. Chaudhuri, Babu Hem Chandra Das Gupta, Mr. H. G. Graves, Rev.

H. Hosten, S.J., Mr. R. D. Mehta, C.I.E., Mr. G. H. Tipper, Dr. Satis Chandra Vidyabhusana, Mr. E. Vredenburg.

Visitors :—Mr. A. Kalousky, Dr. A. Meerwarth, Mr. E. Thuillier, and two others.

The minutes of the last meeting were read and confirmed.

Twenty-eight presentations were announced.

The General Secretary reported that Major R. E. Lloyd, I.M.S., and Mr. K. Ramunni Menon had expressed a desire to withdraw from the Society.

The following gentlemen were balloted for as Ordinary members :—

Dr. A. H. Meerwarth, Asst. Curator, Ethnographical Museum, Academy of Sciences, Petrograd, proposed by Dr. N. Annandale, seconded by Dr. B. L. Chaudhuri; *Dr. Kumud Sankar Ray*, M.A., B.Sc., M.B., Ch.B. (Edin.), Medical Practitioner, 44, European Asylum Lane, Calcutta, proposed by Dr. B. L. Chaudhuri, seconded by Mr. Gopal Das Chaudhuri; *Prof. Kiran Sankar Ray*, B.A. (Oxon), Professor of History, Sanskrit College, 44, European Asylum Lane, Calcutta, proposed by Dr. B. L. Chaudhuri, seconded by Mr. Gopal Das Chaudhuri.

The following gentleman was balloted for as an Honorary Fellow :—

Prof. Herbert A. Giles, LL.D., Cambridge.

The President announced that as only two members have made use of the Library on Wednesday evenings during the past six months, the Council have decided that it shall be closed at 5 P.M., on every week-day.

The President laid on the table a copy of the regulations regarding the award of the "Pinhey Memorial Gold Medal" for the best work on Deccan Archæology or History offered by the Hyderabad Archæological Society.

PINHEY MEMORIAL MEDAL.

The Hyderabad Archæological Society, on the 21st April, 1916, decided that a Gold Medal be instituted to commemorate the memory of Sir Alexander Pinhey, K.C.S.I., C.I.E., the Founder and first President of the Society.

Regulations.

1. The 'Pinhey Memorial Gold Medal' shall be awarded triennially for the best work on Deccan Archæology or History, in accordance with the subjoined conditions.

2. The competition shall be open to scholars in any part of the world.

3. Competitors shall submit a thesis on any subject chosen by themselves relating to Deccan Archaeology or History. The thesis should be an unpublished work, or, if published, it should not have been published more than two years before its submission for the Pinhey Medal.

4. Theses for the first competition will be received up to the end of October 1918, and subsequently in the October of every third year, i.e. in October 1921, 1924, and so on.

5. If the selected thesis is an unpublished work, the Society, at the recommendation of the Council, shall have the right to publish it in the Society's *Journal*.

6. If in the opinion of the Council none of the theses submitted in any year are of special value, the Medal shall not be awarded in that year.

7. If thesis is written in any language other than English, the competitor shall furnish an English translation thereof.

The following papers were read :—

1. *Zoological Results of a Tour in the Far East.*—*Hirudinea.*—By DR. A. OKA. Communicated by DR. ANNANDALE.

2. *Weighing Apparatus from the Southern Shan States, with lantern illustrations.*—By DR. N. ANNANDALE.

These papers have been published in the *Memoirs*.

The President announced that there would be no meeting of the Medical Section during this month.

JUNE, 1917.

The Monthly General Meeting of the Society was held on Wednesday, the 6th June, 1917, at 9-15 P.M.

N. ANNANDALE, ESQ., D.Sc., C.M.Z.S., F.L.S., F.A.S.B., Vice-President, in the chair.

The following members were present :—

Maulavi Abdul Wali, Miss M. L. Cleghorn, Dr. F. H. Gravely, Dr. W. C. Hossack, Mr. R. D. Mehta, C.I.E., Dr. Satis Chandra Vidyabhusana, Mr. E. Vredenburg.

Visitors :—Mr. C. Cleghorn, Miss O. Cleghorn.

The minutes of the last meeting were read and confirmed.

Fifty presentations were announced.

The General Secretary reported the death of Mr. J. G. G. Gardner-Brown, an Ordinary member of the Society.

The General Secretary also reported that Mr. C. W. Peake and Mr. C. S. Price had expressed a desire to withdraw from the Society.

The Chairman announced that Mr. G. H. Tipper, M.A., F.A.S.B., F.G.S., had been appointed a member of Council in the place of Mr. C. S. Middlemiss, resigned.

The following gentlemen were balloted for as Ordinary members :—

Kumar Harib Krishna Deb, M.A., Zamindar, Sovabazar Rajbati, Raja Navakrishna Street, Calcutta, proposed by Dr. B. L. Chaudhuri, seconded by Babu Gopal Das Chaudhuri; *Prof. Kesorimohan Gupta*, M.A., Professor of History, Bangabashi College, 113, Lower Circular Road, Calcutta, proposed by Dr. B. L. Chaudhuri, seconded by Babu Gopal Das Chaudhuri; *Mr. K. V. Rangaswami Aiyangar*, Professor of History and Economics, H. H. the Maharaja's College, Trivandrum, proposed by Mr. V. S. Iyer, seconded by Mr. S. W. Kemp; *Mr. T. O. D. Dunn*, Educational Service, 19, King Edward Court, proposed by Mr. H. G. Graves, seconded by Dr. Satis Chandra Vidyabhusana.

The following papers were read :—

1. *A Fifteenth Century Mosque in the Sunderbans.*—By KHAN SAHIB SYED ABDUL LATIF, B. L.

This mosque, situated in a little village called Majidbaria in the Sunderbans, has been in existence for 1,100 years according to local tradition. The mosque is in a dilapidated state, but it has just been taken over by the Archæological Department for preservation. According to the villagers a stone slab fixed on the mosque was taken away by the Sunderbans Commissioner and is now in the Indian Museum.

2. *The Rauzat-ut-Tahirin.*—By H. BEVERIDGE, I.C.S. (retired).

This paper will published in a subsequent number of the *Journal*.

The Chairman announced that there would be no meeting of the Medical Section during this month.

JULY, 1917.

The Monthly General Meeting of the Society was held on Wednesday, the 4th July, 1917, at 9-15 P.M.

N. ANNANDALE, ESQ., D.Sc., C.M.Z.S., F.L.S., F.A.S.B.,
Vice-President, in the chair.

The following members were present :—

Dr. B. L. Chaudhuri, Dr. F. H. Gravely, Mr. H. G. Graves,
Dr. W. C. Hossack, Mr. W. H. Phelps, Dr. Satis Chandra
Vidyabhusana, Mr. E. Vredenburg.

The minutes of the last meeting were read and confirmed.

Seventeen presentations were announced.

The General Secretary reported that Mr. P. T. Srinivas
Iyenger and Dr. Satyendra Nath Roy had expressed a desire
to withdraw from the Society.

The General Secretary also reported the death of
Mr. James Hector Barnes, B.Sc., F.C.S.

Dr. N. Annandale exhibited a collection of recent and
fossil shells of the subgenus *Margarya* from the Southern Shan
States and invited discussion with the geological and zoological
members of the Society.

The following paper was read :—

A Note on the Dismantling of its Web by a Spider.—By
M. L. CLEGHORN, F.L.S., F.Z.S.

In this paper a description was given of *Epeira theisi* devour-
ing its web in the morning. The radii of the web, below the
notched zone, were devoured first; then the foundation lines
and remains of the collapsed web were eaten slowly. After
dismantling its web completely the spider concealed itself in a
leaf to rest till the evening.

The Chairman announced that there would be no meeting
of the Medical Section during this month.

AUGUST, 1917.

The Monthly General Meeting of the Society was held on Wednesday, the 1st August, 1917, at 9-15 P.M.

H. H. Hayden, Esq, C.I.E., D.Sc., B.A., B.A.I., F.G.S., F.R.S., F.A.S.B., President, in the chair.

The following members were present :—

Maulavi Abdul Wali, Dr. B. L. Chaudhuri, Mr. T. O. D. Dunn, Mr. H. G. Graves, Dr. W. C. Hossack, Rev. H. Hosten, S.J., Rev. K. Oka, Mr. W. H. Phelps, Dr. Satis Chandra Vidyabhusana, Mr. E. Vredenburg.

The minutes of the last meeting were read and confirmed.

Twenty five presentations were announced.

The General Secretary reported that Nawab Ahmad Husain Khan Bahadur of Paryawan had expressed a desire to withdraw from the Society.

The President announced that the following two members being largely in arrears of subscriptions had been declared defaulters and that their names would be posted up in accordance with Rule 38 :—

Mr. Abul Faiz Muhammad Abdul Ali, M.A., Deputy Magistrate, Netrokona, Mymensingh.

Baboo Hemendra Prasad Ghosh, Zemindar and Litterateur, Prasad Lodge, Changalbha P. O., Jessore.

The following gentlemen were balloted for as Ordinary Members :—

Lieutenant-Colonel W. A. F. Basevi, Indian Army, The Staff, Meerut Division, Meerut U.P., proposed by Dr. A. Venis, seconded by Mr. H. R. Nevill; *Prof. D. R. Bhandarkar*, M.A., Carmichael Professor of Ancient Indian History and Culture, Calcutta University, proposed by The Hon. Justice Sir Asutosh Mukhopadhyaya, Kt., seconded by The Hon. Dr. A. Al-Ma'mun Suhrawardy.

The following paper was read :—

The Tattva Cintamani—a most advanced Work on Hindu Logic.—By MAHAMAHOPADHYAYA DR. SATIS CHANDRA VIDYABHUSANA.

This paper will be published in a subsequent number of the *Journal*.

The President announced that there would be no meeting of the Medical Section during this month.

SEPTEMBER, 1917.

A Meeting of the Medical Section of the Society was held at the Society's Rooms on Wednesday, the 12th September, 1917, at 9-15 P.M.

LIEUT.-COLONEL SIR LEONARD ROGERS, Kt., C.I.E., M.D., B.S., F.R.C.P., F.R.C.S., F.A.S.B., F.R.S., I.M.S., Vice-President, in the chair.

The following members were present :—

Dr. Gopal Chandra Chatterjee, Dr. K. K. Chatterjee, Dr. W. C. Hossack, Lt.-Col. W. D. Sutherland.

Visitors :—Dr. Charu Chandra Bose, Dr. A. D. Cameron, Dr. B. Chakravarti, Dr. S. Ghosh., Major R. E. Lloyd, I.M.S., Dr. Jitendra Nath Moitra, Dr. J. C. Mukerjee.

The minutes of the meeting held on 13th December, 1916, were read and confirmed.

Lieut.-Col. Sir Leonard Rogers, Kt., F.R.S., I.M.S., read a paper entitled "A Case of Intense Malignant Tertian Malaria successfully treated by quinine acid hydrobromide intravenously and the failure of 'Splenox' in Benign Tertian Malaria."

Lieut.-Col. Sir Leonard Rogers, Kt., F.R.S., I.M.S., showed cases, drawings and photographs of leprosy illustrating the value of injections of Gynocardate of Soda and Chaulmugrate of Soda in its treatment.

Dr. K. K. Chatterji showed a case of Hydrocele he had operated on.

OCTOBER, 1917.

The Monthly General Meeting of the Society was held on Wednesday, the 3rd October, 1917, at 5-30 P.M.

H. H. HAYDEN, Esq., C.I.E., D.Sc., B.A., B.A.I., F.G.S., F.A.S.B., F.R.S., President, in the chair.

The following members were present :—

Dr. N. Annandale, Dr. P. J. Bruhl, Dr. H. G. Carter, Dr. W. A. K. Christie, Mr. G. de P. Cotter, Dr. W. C. Hossack, Mr. H. C. Jones, Mr. G. H. Tipper, Dr. Satis Chandra Vidya-bhusana, Mr. E. Vredenburg.

The minutes of the August meeting were read and confirmed.

Thirty-nine presentations were announced.

The General Secretary reported that Mr. E. Digby, Mr. T. Southwell and Mr. F. D. Ascoli, I.C.S., had expressed a desire to withdraw from the Society.

The General Secretary also reported that Raja Ooday Pratab Singh, a Life Member, and Dr. Hendrick Kern of Utrecht, an Hon. Fellow, were dead.

The President announced that in accordance with Rule 38 of the Society's Rules, the names of the following two members had been posted up as defaulting members since the last meeting, and their names have now been removed from the member list :—

Mr. Abdul Faiz Muhammad Abdul Ali, M.A., Deputy Magistrate, Netrokona, Mymensingh.

Babu Hemendra Prasad Ghosh, Zamindar and Litterateur, Prasad Lodge, Changalbha, P.O. Jessore.

The President also announced the following modifications, approved by Council, of the Regulations regarding the Election of Fellows, the Award of the Barclay Memorial Medal, and the Library.

REGULATIONS REGARDING THE ELECTION OF FELLOWS.

1. Nomination papers shall be sent so as to reach each Fellow by the 1st October of the year preceding the election.

2. The nomination papers must be received back duly filled in and signed by each Fellow by the 1st November, and no paper received after this date will be considered.

2A. Each candidate shall be nominated by at least two Fellows. Each nomination paper shall set out in detail the qualifications of the candidate, including references to his most important original papers. Any Fellow is at liberty to add his signature, or to authorize in writing the Honorary Secretary to add his signature, in support of any candidate before the voting papers are sent out, in addition to nominating one candidate. The nomination papers will be open to inspection by any Fellow for this purpose in the Society's Rooms.

3. A list of persons proposed, with their qualifications, shall be compiled from the nomination papers and printed and sent out to each Fellow so as to reach him by the end of November.

4. The Fellows shall then vote for not more than the number to be elected in the succeeding year by placing a cross against the names of those he wishes to be elected, and no

paper with more than the maximum number of crosses for the year's election will be accepted. These papers must be returned so as to reach the Society's rooms in time for the meeting referred to in Rule 6.

5. The voting papers mentioned in Rule 4 shall be enclosed unsigned in a separate sealed envelope which shall be forwarded in an outer cover with a covering letter signed by the Fellow.

6. There shall be a meeting of Fellows in the first week in January at which the voting papers shall be opened and counted as the Chairman directs, and the names of such candidates as receive a majority of the votes of the Fellows voting shall be placed before the meeting.

7. If more than the maximum number to be elected have received the qualifying vote, those receiving the highest number of votes shall be proposed for the vacancies.

8. In the event there being a tie for the last vacancies, the Fellows present at the meeting shall decide which of the candidates receiving the same number of votes shall be proposed to the Council for nomination to the Society for a Fellowship.

9. These nominations shall be laid before the Council at the January meeting in the fourth week, and the Council shall finally make the nomination.

10. The nominations shall be read out to the members at the Ordinary Annual Meeting in February, and voting papers shall be provided for each member present, who shall record his vote in the same manner and under the same conditions as for the officers and members of Council of the Society.

RULES REGARDING THE AWARD OF THE BARCLAY MEMORIAL MEDAL.

1. The medal will be awarded each alternate year at the Anniversary Meeting of the Asiatic Society of Bengal held on the first Wednesday of February.

2. The medal will be bestowed on that individual who, not having been a recipient of the medal during the preceding seven years, shall be deemed by the Council of the Asiatic Society to have made, up to the 31st of December next preceding the award, the most meritorious contribution to Medical or Biological Science with special reference to India.

3. The Council will at the meeting next preceding the General Meeting in November, appoint a Special Committee of five members of the Society who shall include the Biological Secretary to the Society for the time being.

4. This Special Committee shall be termed the "Barclay Memorial Medal Committee," and the Biological Secretary of the Society, its only ex-officio member, shall be its Convener

and Chairman. The members nominated by the Council to serve on this Committee shall be persons known to be learned in different branches of Biology. Three members of the Committee shall form a quorum.

5. The Chairman of the Committee will call a meeting of the Committee on the first convenient date subsequent to the first Wednesday of December, at the same time requesting members to bring with them to the meeting detailed statements of the work or attainments of such candidates as they may wish to propose. The Committee will then proceed to make such arrangements as may be necessary for the selection of the name or names to be submitted on or before January 15th to the Honorary Secretary, who will lay their recommendations before the Council at their next meeting. In no case shall more than three names be submitted, and if more than one name be submitted the Committee shall, if possible, indicate the name to which they consider that preference should be given.

LIBRARY REGULATIONS.

17. No person who is not a member of the Society shall be permitted to take away any book from the Library without special authority from the Council. And no such person shall have access to the Library without permission of the President or one of the Secretaries, excepting only Members of the Royal Asiatic Society of Great Britain and Ireland, and its branches and Associate Societies, who may be temporarily in Calcutta.

The proposed additions and alterations to the Society's Rules 2A, 2(c) and 41, of which intimation had been given by circular to all resident members in accordance with Rule 64 A, were brought up for discussion.

In order to give the initials F.A.S.B. a definite standing, the Council recommends the addition at the end of Rule 2A of the following sentence :—

“ Fellows shall be entitled to add after their names the initials F.A.S.B.”

In connection with the election of Associate Members, the Council recommends the following addition to Rule 2 (c) :—

“ They shall be elected for a term of 5 years but shall be eligible for re-election.”

Several persons elected Associate Members are now in a position to become Ordinary Members but do not do so, and consequently prevent the election of others who deserve to replace them.

In Rule 41, after the words "after being admonished by the President" the Council recommends the addition of the following :—

"Or if for any other reasons it shall appear to the Council that the name of a member should not remain on the rolls";

also that the words "for misconduct" in the margin be deleted.

As the rule stands at present the Council cannot remove the names of persons who have committed public offences, unless they also chance to be guilty of misconduct towards the Society.

The resolutions were laid before the Meeting on 3rd October, and would be voted for at the Meeting of 7th November, 1917.

The following three gentlemen were balloted for as Ordinary Members :—

Mr. B. B. Dey, D.Sc. (London), *F.I.C.* (England), Prof. of Chemistry, Presidency College, Calcutta, proposed by Dr. B. L. Chaudhuri, seconded by Dr. Kiran Sankar Ray; *Mr. Meghnad Saha, M.Sc.*, University Lecturer, University College of Science, Calcutta, proposed by the Hon. Justice Sir Asutosh Mukerjee, Kt., seconded by the Hon. Dr. A. Suhrawardy; *Mr. Satyendranath Bose, M.Sc.*, University Lecturer, University College of Science, Calcutta, proposed by the Hon. Justice Sir Asutosh Mukerjee, Kt., seconded by the Hon. Dr. A. Suhrawardy.

The President announced that there would be no adjourned meeting of the Medical Section this month.

NOVEMBER, 1917.

The Monthly General Meeting of the Society was held on Wednesday, the 7th November, 1917, at 9-15 P.M.

N. ANNANDALE, Esq., D.Sc., C.M.Z.S., F.L.S., F.A.S.B., Vice-President, in the chair.

The following members were present :—

Maulavi Abdul Wali, Dr. P. J. Bruhl, Miss M. L. Cleghorn, Dr. F. H. Gravely, Mr. H. G. Graves, Dr. L. L. Fermor, Mr. S. W. Kemp, Dr. K. S. Ray, Dr. Satis Chandra Vidyabhusana, Mr. E. Vredenburg.

Visitors :—Capt. H. Berkeley, I.A., Mr. C. Cleghorn, Miss O. Cleghorn.

The minutes of the last meeting were read and confirmed.

Twenty-one presentations were announced.

The General Secretary reported that Dr. Phillip Lechman Stallard, an Ordinary Member, and Rai Bahadur B. A. Gupte, an Associate Member, had expressed a desire to withdraw from the Society.

The General Secretary also reported that Mr. J. H. Little, an Ordinary Member, and Dr. Ernst Haeckel, a Special Honorary Centenary Member, were dead.

The Chairman announced that the following two members, being largely in arrears of subscriptions, had been declared defaulters, and that their names would be posted up in accordance with Rule 38 :—

The Hon. A. K. Ghuznavi, Mymensingh.

S. P. V. Ranganathaswamy, Aryavaraguru, Arshya Library, Vizagapatam.

The proposed additions and alterations to the Society's Rules 2A, 2(c) and 41, of which intimation had already been given by circular to all members under Rule 65, were brought up for final disposal.

The votes of the members were laid on the table and the Chairman requested any members who had not expressed their opinions to take the present opportunity of filling in voting papers.

The Chairman appointed Mr. E. Vredenburg and Dr. K. S. Ray to be scrutineers.

The scrutineers reported as follows :—

For amendment of Rules 2 A and 2 (c)	..	69
For amendment of Rule 41	..	63
Against amendment of Rule 41	..	6
Carried.		

The Chairman announced that in accordance with Rule 41, the Council had decided to propose to the Society the removal of the following enemy aliens from the member list. The proposition would be submitted to ballot at the next meeting of the Society.

Ordinary Members.

1. Dr. Herman Finck, M.D., Ahmednagar.
2. Graf Karl L. Luxburg, S. America.
3. Joseph Henry Charles Schulten, Esq., Ph.D., Europe.
4. Dr. O. Strauss, Ahmednagar.

Honorary Fellows.

5. Dr. A. Engler, Prof. of Systematic Botany, University of Berlin, Prussia.
6. Prof. Ignaz Goldziher, Ph.D., D.Litt., LL.D., Budapest, Hungary.
7. Dr. H. Oldenberg, The University, Gottingen, Germany.
8. Prof. Theodor Noeldeke, c/o Mr. Karl T. Trubner, Strassburg, Germany.

Dr. Annandale exhibited a weighing beam of the Bismar type from the Darjeeling hills.

The following papers were read :—

1. *Zoological Results of a Tour in the Far East. Mollusca Nadibranchiata (Ascoglossa).*—By SIR CHARLES ELIOT.

This paper has been published in the *Memoirs*.

2. *Zoological Results of a Tour in the Far East. Decapoda and Stomatopoda.*—By S. KEMP, B.A.

This paper will be published in the *Memoirs*.

3. *Some observations and experiments on the rust on Launea asplenifolia D. C.*—By KARM CHAND MEHTA.

This paper will be published in the *Journal*.

The Chairman announced that the next adjourned meeting of the Medical Section would be held on Wednesday, the 14th November, 1917, at 9-30 P.M.

A Meeting of the Medical Section of the Society was held at the Society's Rooms on Wednesday, the 14th November, 1917, at 9-15 P.M.

LIEUT.-COLONEL SIR LEONARD ROGERS, KT., C.I.E., M.D., B.S., F.R.C.P., F.R.C.S., F.A.S.B., F.R.S., I.M.S., Vice-President, in the chair.

The following members were present :—

Dr. A. S. Allan, Dr. K. K. Chatterjee, Mr. T. O. D. Dunn, Dr. W. C. Hossack, Major D. McCay, I.M.S., Lieut.-Col. F. O'Kinealy, I.M.S., Capt. J. D. Sandes, I.M.S., Major H. B. Steen, I.M.S., Lieut.-Col. W. D. Sutherland, I.M.S.

Visitors :—Dr. A. C. Bhattacharjee, Dr. Ramanuja Chakravarti, Dr. B. M. Chatterjee, Dr. O. K. Chatterjee, Dr. P. Chatterjee, Capt. N. H. Hume, I.M.S., Dr. Charubrata Sen, Dr. K. P. Sen.

The minutes of the September meeting were read and confirmed.

